THE APPLE II MAGAZINE

# inCider

A CWC/I PUBLICATION

PAGE 54
EASY APPLEWORKS MAILING LISTS AND LABELS

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- Less Paperwork; More Free Time
- Power Desktops: Jeeves vs. Pinpoint

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- MicroExpert
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## JUDY COLLINS:

An Autobiography with AppleWorks

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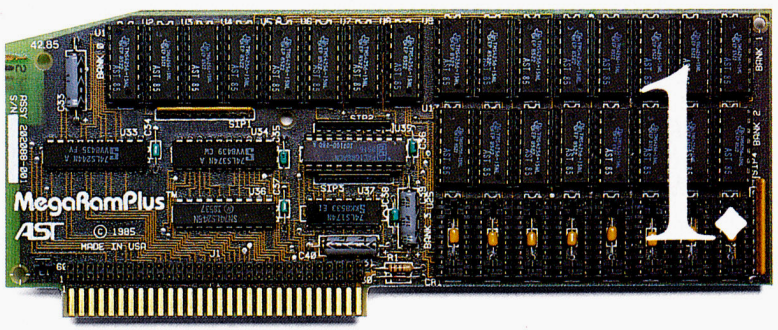


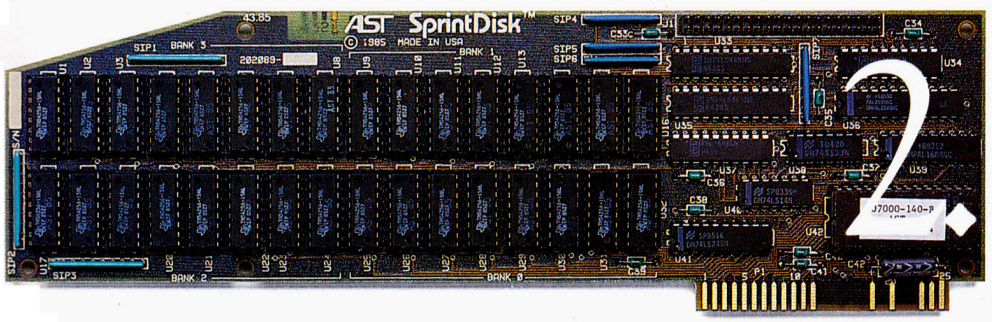


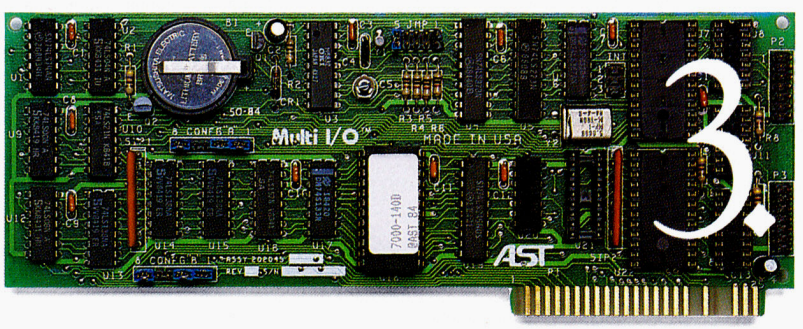

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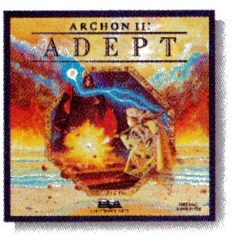


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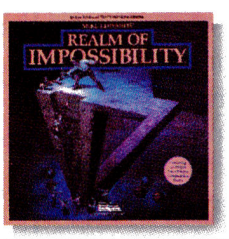


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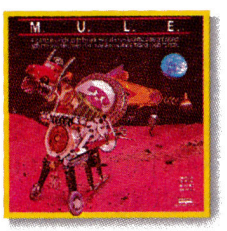


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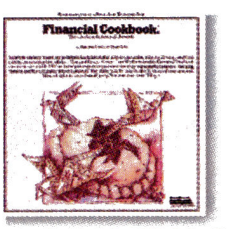


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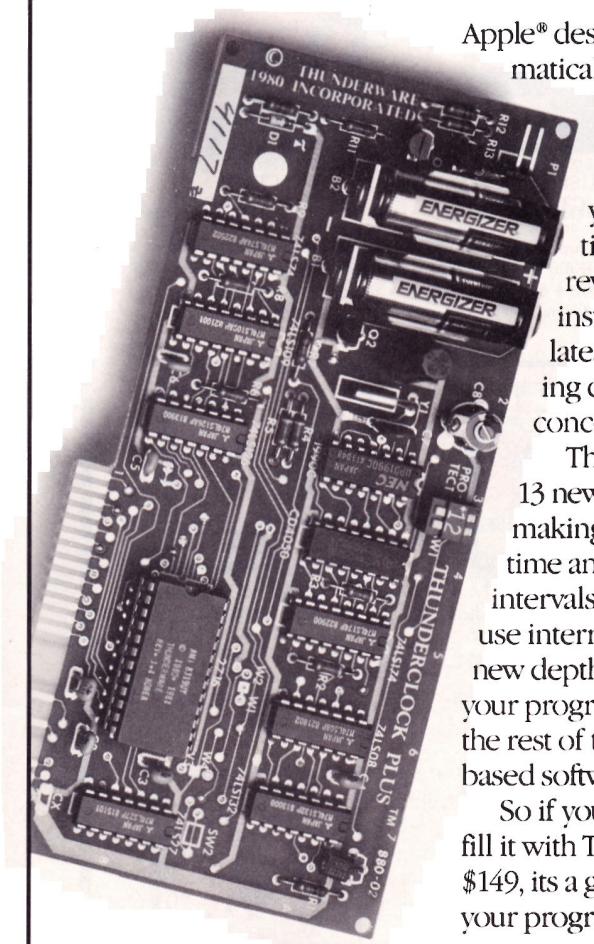


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MPA ABC

# INCIDER'S VIEW

## The Fun Factor

by Deborah de Peyster

*"We have a theory, and it goes like this: The more fun you have doing something, the better job you do."*

We have a theory, and it goes like this: The more fun you have doing something, the better job you do. It's called the fun factor, and in its simplicity is a lot of truth. You can't have success without a healthy fun-factor rating.

Let's review this principle. Mindscape Inc. has produced a series of hit software programs for the Apple II market, including The Halley Project, Bank Street Music Writer, and the Color Me: Computer Coloring Kit. For the Macintosh, its hits include Deja Vu and Balance of Power. Company president Roger M. Buoy is, quite frankly, seriously hooked on Balance of Power, and has yet to figure out the mystery in Deja Vu. And as a native Australian, he's obviously rooting for the Aussies in Mindscape's newest Apple II game, The American Challenge (with hit song *Win Back the Cup*). He and his other managers at Mindscape have a lot of fun at what they do, and the company's success last year shows it.

Infocom, in Cambridge, Massachusetts, is widely known for its top-selling adventure games. What is less widely known but equally important is its Funcom Committee—the group of people at the company in charge of scheduling hijinks. The regular Friday afternoon party is where orchestrated misadventures often show up, or in the company newsletter, where nothing is sacred. When the Infocom staff moved to new headquarters last fall, the shine of corporate culture was quickly dimmed with signs tacked to doors denoting the executive suite as "Big Cheese," the developers' offices as "Mixed Nuts," and the sales department as "Snake Oil." Sound like fun? Maybe not to you, but it's fun for the people at Infocom. And that's what counts. The company's sales prove it.

That's an interesting point about the fun factor. Fun is defined by the people at the company, not by any external force. And the definition of fun can change as corporate cultures change. Take Apple Computer Inc., for example. The definition of fun used to be friendly competition between the Apple II and Macintosh groups, beer blasts in the late afternoon, group t-shirts, rock music, and flexi-time that reached new limits. It worked then, and Apple was roaringly successful. No longer.

Key Apple funsters, Steve Wozniak and Steve Jobs, left, and fun all but disappeared from the Apple employees' vocabulary until the beginning of 1986. Shortly before his departure, the Woz wrote in an autograph, "Here's hoping computers always get better and remain fun to use." For the Woz, computers were not getting better (the Apple //x project had been killed) and without that 16-bit processor, computers weren't as fun to use. The fun-factor rating at that time, about March 1985, was a poor 40 percent. Apple's trouble with profits matched the poor rating—it experienced its first quarterly loss.

Now fun is beginning to return, but with a more button-down, corporate flair. Employees are beginning to feel a total company spirit, where isolated groups existed before. Friday afternoon parties remain, but now draw people from all over the company, instead of just from one particular division. The beer now appears in six-packs instead of just a keg, and the potato chips are often put into bowls. Tables are set up, and someone might occasionally call a caterer to drop off a few food trays.

And Apple leader John Sculley is finally coming into his own, having weathered the dissolution of the old corporate culture and proved to those who remain that the newly unified Apple has a lot to offer. The strength of his ideas and his determination to succeed are beginning to permeate the company. And while he may not sport the Steve Jobs blue-jeans-and-suspenders look, he gets his own lunch in the employee cafeteria and looks more comfortable in khakis than pin-stripe.

It's time to revise Apple's fun-factor rating. We give it 70 percent, and note that it's on the rise. If we're right, healthy 1986 second-quarter profits this month should prove our theory.■

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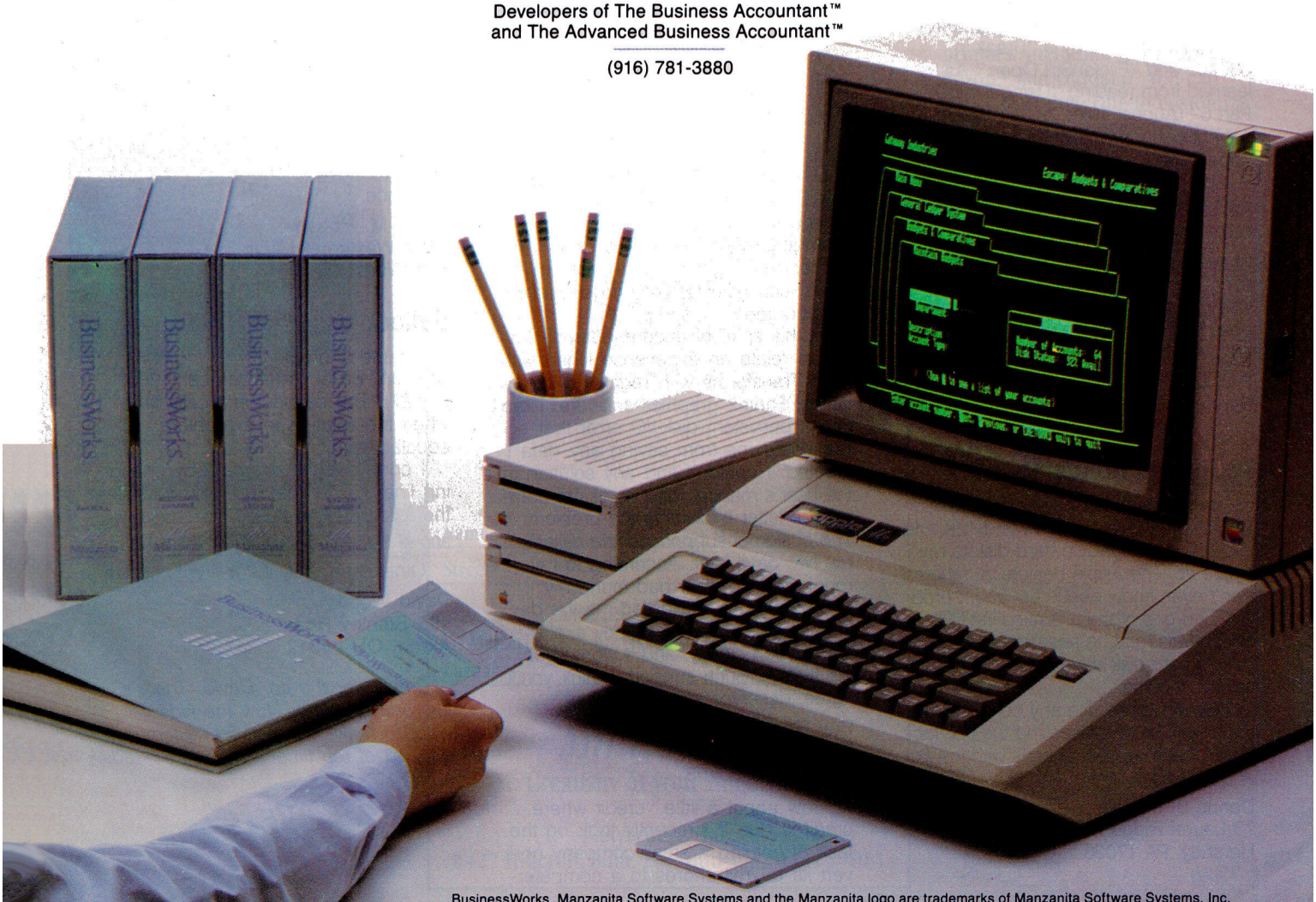


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# LETTERS

## The Elegant Escape

"Leaving the Escape Mode Behind" (June 1985, p. 32) was one of the most useful articles I've read in quite some time. Using Apple Writer and its glossary functions to type in BASIC program listings is a godsend.

I have only one complaint. The author failed to make allowances for the recently released ProDOS-based Apple Writer, version 2.0, in writing the capture routine for translating Applesoft into Apple Writer text files. If you run the capture routine the way it's listed under ProDOS, you'll get a "File Busy" error message, followed by a "Break in 63040" and "File(s) Still Open." As I learned from reading "Using ProDOS—Part 6" (August 1985, p. 38), ProDOS will not perform an operation on an "open" file.

I got around this problem by adding the following line:

```
63035 PRINTD$;"CLOSE";F$
```

I have no experience with programming, so there may be a more elegant way of getting the job done. This line does seem to work, though.

**Brad Townsend**
**P.O. Box 181**
**Byron, IL 61010**

## Peripheral Ponderances

I am considering adding an Applied Engineering Z-RAM card with 512K and a Quark 10-megabyte hard disk to my Apple //c. The Apple dealers in my area don't even know about the Quark product, and one of them thinks First Class Peripherals may be releasing a //c-compatible hard-disk drive within the next several months.

I would appreciate any comments you might have concerning the interfacing of these two peripherals with the //c and with each other.

**Donna B. Munger**
**78 Laurel Ridge Road**
**Hershey, PA 17033**

*Both the Z-RAM 512K card and the Quark QC10 hard-disk drive are compatible with the //c, and they should work with one another. We've heard of memory conflicts between Applied Engineering's RAMdrive software and another hard disk, though. If you plan to use the Z-RAM as a RAM disk in conjunction with the QC10, you should try them out before buying them. A representative at First Class Peripherals says the company has no plans at the moment for a //c-compatible Sider. —eds.*

## Satisfied Customers

As a new Apple user with a //c and all Apple peripherals, I've found your publication to be first rate and a great deal of help. I noticed that in your review of The Newsroom (August 1985, p. 64) John Barry made special mention of the courteous help he received when he talked to the Springboard Software program-development manager about a problem he had. Such help is rare and should be encouraged.

In this spirit of encouragement, I'd like to relate an experience I had with Data Transforms with regard to its excellent Fontrix graphics software. I ran into a persistent disk-I/O error that prevented me from saving any data I created. I couldn't find any solution in the user's manual, so I wrote the company a letter explaining the problem. The customer-support people called me two days later. According to my rough figuring, they had found my phone number and called me the day they received the letter. They explained the solution clearly, and it worked on the first try. Such support, I think you'll agree, deserves special mention.

**Ray Groshong**
**Contee Road**
**Laurel, MD 20708**

How about a little "credit where credit is due"? I recently took on the task of helping a small company convert its payroll chores to a computer-based system on an Apple //e.

The first pass was a flop—the system crashed repeatedly, and help was nonexistent, as the software publisher chose that time to go "belly up."

A more diligent search of software catalogs led me to BPI Systems, of Austin, Texas, which produces an excellent package. It runs on many computers, including the Apple II line, with hard- or floppy-disk drives.

The real value is the support I'm receiving from BPI. Several BPI people have bent over backward to help me get the system started—not just with technical support, but in many ways too numerous to mention here. I don't know all their names, but I appreciate their help just the same.

BPI is an organization that will stand behind its products. I sincerely hope it enjoys a long and successful existence.

**David M. Hoban**
**4824 Westcreek Drive**
**Fort Worth, TX 76133**

## Ballooning

I found a problem with *inCider*'s program Balloons (November 1985, p. 127). The dart automatically fired when the solution to a problem equaled zero.

I corrected the program by changing line 300 to line 305, and adding the following line 300:

```
300 IF SD(LR)=1 OR Q$="" THEN 350
```

Other than that, it's a fine program.

**David Woods**
**495 Stanley Road**
**Akron, OH 44312**

*Thanks for the tip, David. There's just one problem: Now the kids will want to make the dart fire automatically all of the time! —eds.*

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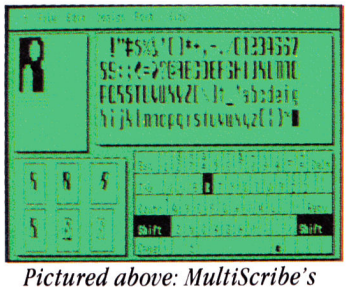

*Pictured above: MultiScribe's font editor.*

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# LETTERS

## Looking Back

I recently purchased an Apple //e, so I hadn't seen your magazine before, yet I'm sure a number of back issues of *inCider* contain a lot of valuable information. For example, I'm considering buying a hard-disk drive and would very much like to read your review of The Sider. Is it possible to get a copy of that issue? Also, have you ever reviewed RAM expansion cards?

I'm an independent stock-market investor, and I'm trying to find a really good program for analyzing stock-market investments. Have you reviewed any of these?

**Maxa Moss**
**P.O. Box 206**
**Stamford, NY 12167**

*First Class Peripherals' Sider hard-disk drive was reviewed in the April 1985 issue (p. 93) and was featured as Editors' Choice in the May issue (p. 128). It also appeared in "Hard-Driving Disks" (September 1985, p. 24), a comparison review of hard-disk drives. Check the September Editors' Choice for Applied Engineering's Z-RAM card (p. 128), and the December 1985 issue for "Thanks for the Memory," a feature review of RAM expansion cards (p. 18). December also contains a review of CBS Software's Stockpak II (p. 127).*

*You might also check out a software directory, such as the* PC Clearinghouse Directory, The Book of Apple Software, *or the* OMNI Complete Catalog of Computer Software, *to name a few, for the vast number of stock packages available. There's one that's sure to suit you.*

*To order back issues, write to* inCider, *Back Issues Department, Route 101 and Elm Street, Peterborough, NH 03458. Enclose $3.50 plus $1 postage for each copy you order. You may charge it to your VISA, MasterCard, or American Express by calling (800) 258-5473. —eds.*

## The Gaming Sort

I was very surprised and disappointed when I received my November issue of *inCider* and didn't find the Game Reserve. Above all, I look forward to reading about the latest in Apple II entertainment. I hope you intend to continue this section. It has become even more important to me since my favorite game-review magazine went out of business.

I'd like to suggest that you not review bad games. There are more than enough good games to review, and I see no reason to waste valuable space on poorer-quality games. Also, it's important to review newly released games and to avoid reviewing the same games other magazines do.

I thoroughly enjoy your magazine. It is by far my favorite. Keep up the good work.

**Donald T. Wile**
**2771 Longford Drive**
**San Jose, CA 95132**

*Production considerations necessitated leaving Game Room, as it is now named, out of the November issue, but we certainly plan to continue running it. We try to review a broad selection of the current entertainment offerings for the Apple, some good and some not so good. Reviewing only the "good games" would give you just one side of the story.*

*Thank you for your comments. We're pleased you enjoy* inCider. *—eds.*

---

inCider *welcomes readers' comments regarding articles, letters, or other topics of interest. We reserve the right to edit letters for clarity, style, and space. Please address your correspondence to Letters,* inCider, *80 Pine Street, Peterborough, NH 03458.*

## December BackTalk Response

The results of our holiday-wishes BackTalk poll (December 1985, p. 56) are in. For both giving and receiving, hardware products were at the top of most respondents' lists. Half of the readers answering our questionnaire asked for a modem as a practical gift, and half included a modem in their three-item dream lists. Printers, RAM cards, hard disks, and color monitors were other popular requests (approximately 25 percent each). Half the responses also included software, with various graphics packages and games the favorite choices.

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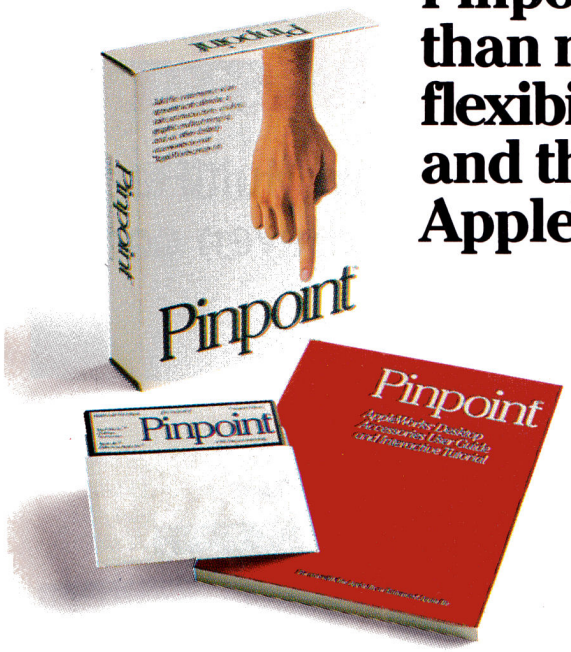
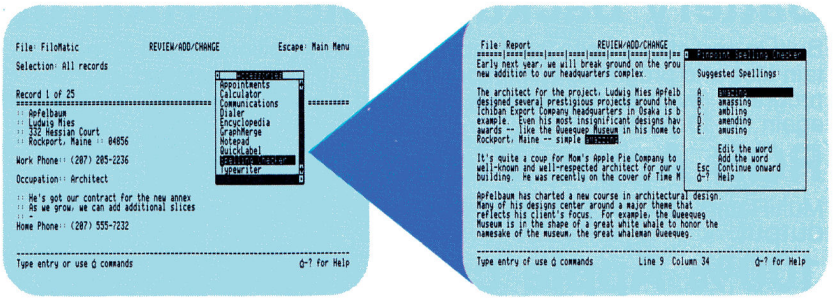
Michael Fischer, *Bay Area Computer Currents.*
Author, *65816 Assembly Language Programming.*

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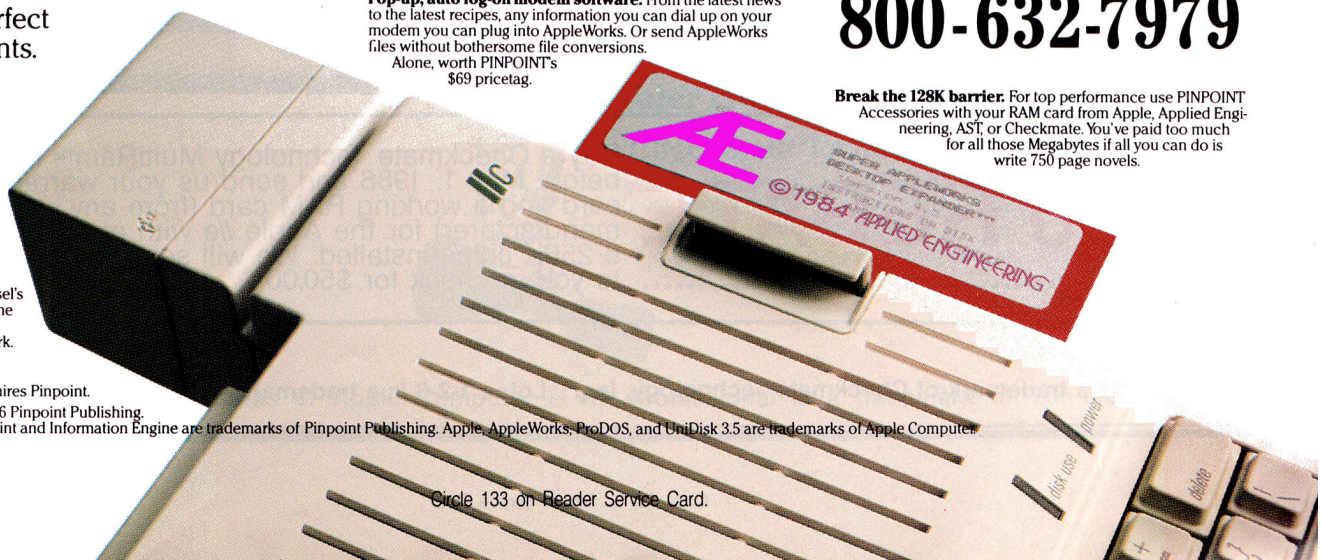


†See Softsel's Hot List, the industry benchmark.

*Requires Pinpoint.

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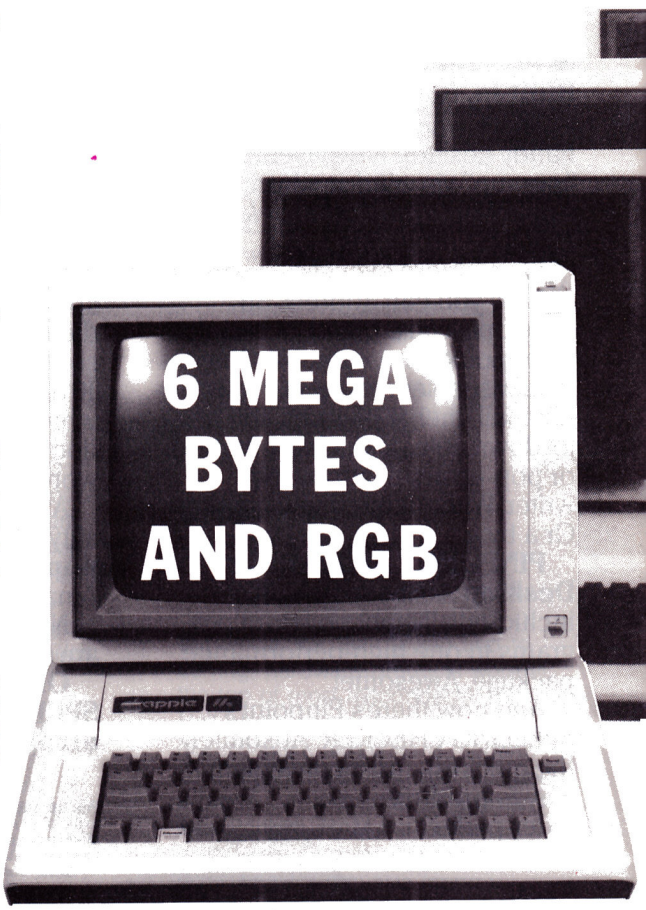


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# NEWS LINE

edited by Wendy Lea McKibbin, *inCider* staff

## Chatting with Your Apple

Suppose you're entering a list of numbers into the computer and you don't want to take your eyes off the page to search for keys. The technology now exists to let you enter data merely by reading these numbers aloud to your system—which will read them back to you and then ask, "Is this okay?"

Brad Stewart, Vice President of Research for Covox, Inc., of Eugene, Oregon, explains that the interaction of word recognition and speech synthesis makes it possible to literally talk to your computer. While his company does not market a product in the form described above, Covox does supply the requisite technology for the components with its Voice Master system and a line of tool kits for voice I/O products.

Voice recognition, Stewart says, has long had a place in factory settings and is finally becoming affordable for the microcomputer user. (See "Apples Within Earshot," July 1985, p. 14, for more information on voice-recognition technology.) He suggests a number of intriguing applications for speech technology on the Apple. For example, you could verbally move your spaceships around in a computer game; turn off lights and television with a word to an environmental controller; dial the telephone numbers of friends just by saying their names; or protect your home with voice-activated locks. A speech-activated system can also be quite a boon to a handicapped person.

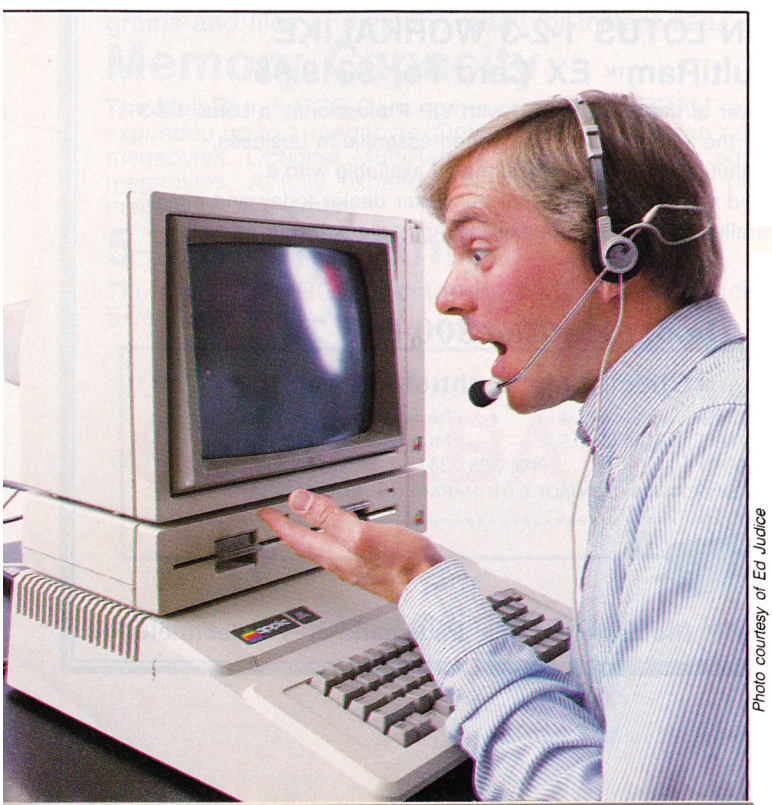

Photo courtesy of Ed Judice

One product Covox may soon bring to the Apple market is a voice-activated interface for word-processing software. Stewart explains that this will let users edit, print, and execute system commands with just a word or two to the Apple.

## Do Mac Users Want II Software?

While International Solutions, Roger Wagner Publishing, and a growing number of other firms are bringing Mac-like software to the II environment, a company in southern California is offering developers a chance to go in the opposite direction. Abaton Technology Corporation's Transform product (see New Products, January 1986, p. 86) converts Apple II application programs to software that runs on the Mac—a feat that has stirred something of a debate in the development community.

"No one denies that the concept is tremendous, but we can't figure out *why* anyone would want to take Apple II software to the Mac environment," says Dick Hubert, president of the Bellevue, Washington-based A.P.P.L.E. Co-op, a group whose membership consists primarily of Apple developers. "People who have tried to do manually what Abaton provides have ended up with pretty unsuccessful products," Hubert continues. "The problem is that the Mac environment is just too different—traditional Apple II software can't duplicate the user interface Mac owners expect." At best, Hubert concludes, the Abaton Transform could get a developer to the starting point for creating a Mac product.

In defense of Transform, Abaton plans to introduce a source-code generator for converted programs, which is intended to make it easier for a developer to add Mac-interface features like pull-down menus. Andy Hertzfeld of the original Mac software-design team says this product won't help, however. He claims that in fact it will make matters worse.

"What you'd have is a program in a strange assembly language if you ran it through Abaton's source-code generator," remarks Hertzfeld, who has since left Apple to become an outside consultant. "You'd be better off just adding things yourself."

Hertzfeld predicts that a flight simulator and certain Apple games, in addition to some vertical applications, would be very attractive to Mac users. But he says he can't think of any "productivity-type" software from the II library that would interest a Mac user.

## Apple Loyalists Losing Patience

Local members of the Apple Puget Sound Program Library Exchange are threatening to jump ship if Apple doesn't come out soon with the long-awaited 16-bit system code-named the "//x."

According to Dr. David Lingwood, who sits on the board of the Oregon-based user group, Apple has "just about used up its reservoir of good will in the user community." Lingwood claims that as many as

two-thirds of the local members have said they will move to another brand if Apple doesn't produce an upgraded machine. Some members are unwilling to wait more than six months. "It's getting very, very late for Apple," Lingwood warns.

Developers such as MicroRain of Redmond, Washington, are also eagerly awaiting a faster, more powerful computer. MicroRain is planning to introduce a line of software for the //e and //c called "Magpie," which will duplicate the Macintosh environment on the II. Company president Joey Gurango explains that Magpie will be sold as separate software modules, but will function as an integrated package, much like AppleWorks. The success of his new Mac-like software, he notes, is contingent on having a system with enough horsepower and memory to keep the product from becoming cumbersome.

"Magpie on an expanded 128K //e with 800K drives will be operable, but slow," Gurango says. "The software has really been developed with the //x in mind."

## Wrong Signals

"Drill and practice" are not dirty words, says Leroy Finkel of the San Mateo County Office of Education in Redwood City, California, but developers are getting the wrong signals about what's hot in educational software. Consequently they're shunting their scarce development dollars in the wrong direction.

One problem is that many market-research questionnaires omit important categories of software when querying educators. Worse still, Finkel notes, these forms are sometimes sent to the wrong people. "What really gets me going is when the principal of a school lists Rocky's Boots as a drill-and-practice package," Finkel says. "This type of misinformation confuses developers about what teachers want and need."

Rather than look to a Softsel list for ideas on what will succeed in the classroom (another misleading approach, because Softsel represents the home rather than the institutional market), Finkel suggests that more developers emulate Sunburst. "The Sunburst products are a universal favorite with teachers," Finkel says. "They promote critical-thinking and problem-solving skills, and if they incorporate drill-and-practice routines, it's done in a creative way."

Photo courtesy of Apple Computer, Inc.

The Mobile County Public School District of Mobile, Alabama, may soon come to the aid of developers who are in doubt about what works in the classroom. The district is planning a three-year experimental project with 600 students in fifth, eighth, and 11th grades. Half the group will use traditional drill-and-practice routines, while the other students will test software that promotes problem-solving skills. The district hopes to show higher achievement-test scores in the group using the computer as a thinking tool. Test scores will be compared annually.

*We're always looking for news of the Apple world. If you're making news, send your press releases and photographs to News Line,* inCider, *1060 Marsh Road, Suite C-200, Menlo Park, CA 94025.*

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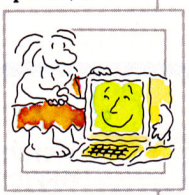

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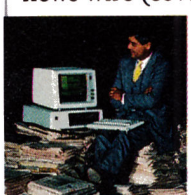

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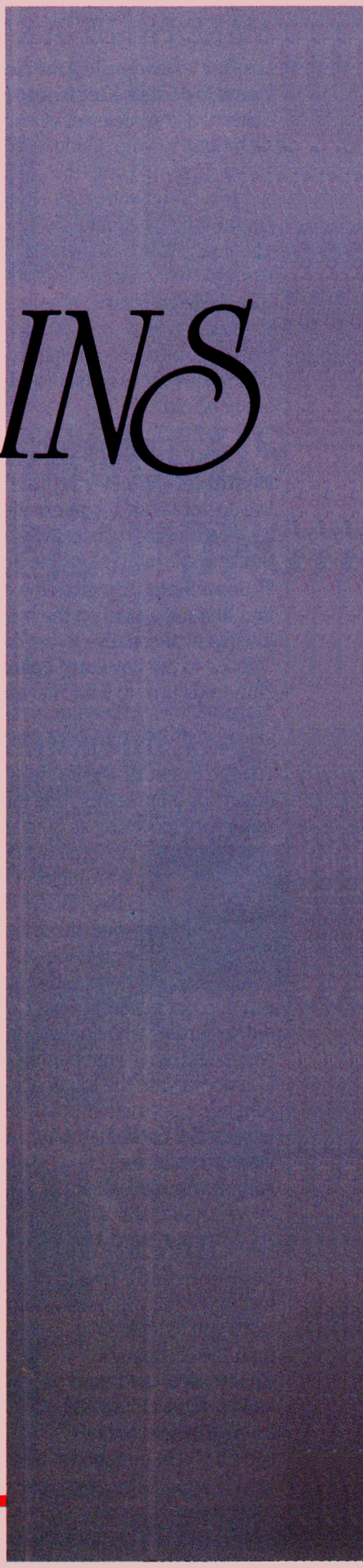
# JUDY COLLINS

*AppleWorks has made her writing tasks easier.*



by Paul Statt, *inCider* staff

Judy Collins is rather shy and rather independent—like her music, her films, and her writing. Her New York City home is decorated with colorful paintings she and her friends have created, and snapshots of friends. She reads a great deal—her home is littered with books, especially memoirs, lives, and autobiographies. Perhaps they represent research into her latest project, the story of her life.

When Judy talks about her Apple //c and AppleWorks, she speaks of her "friends." Like the friends who helped her make six gold albums and the award-winning film *Antonia*, they are companions that stand by her without standing in the way. "Just because I'm like I am—independent," she says, "I like to do it on my own and see what happens.

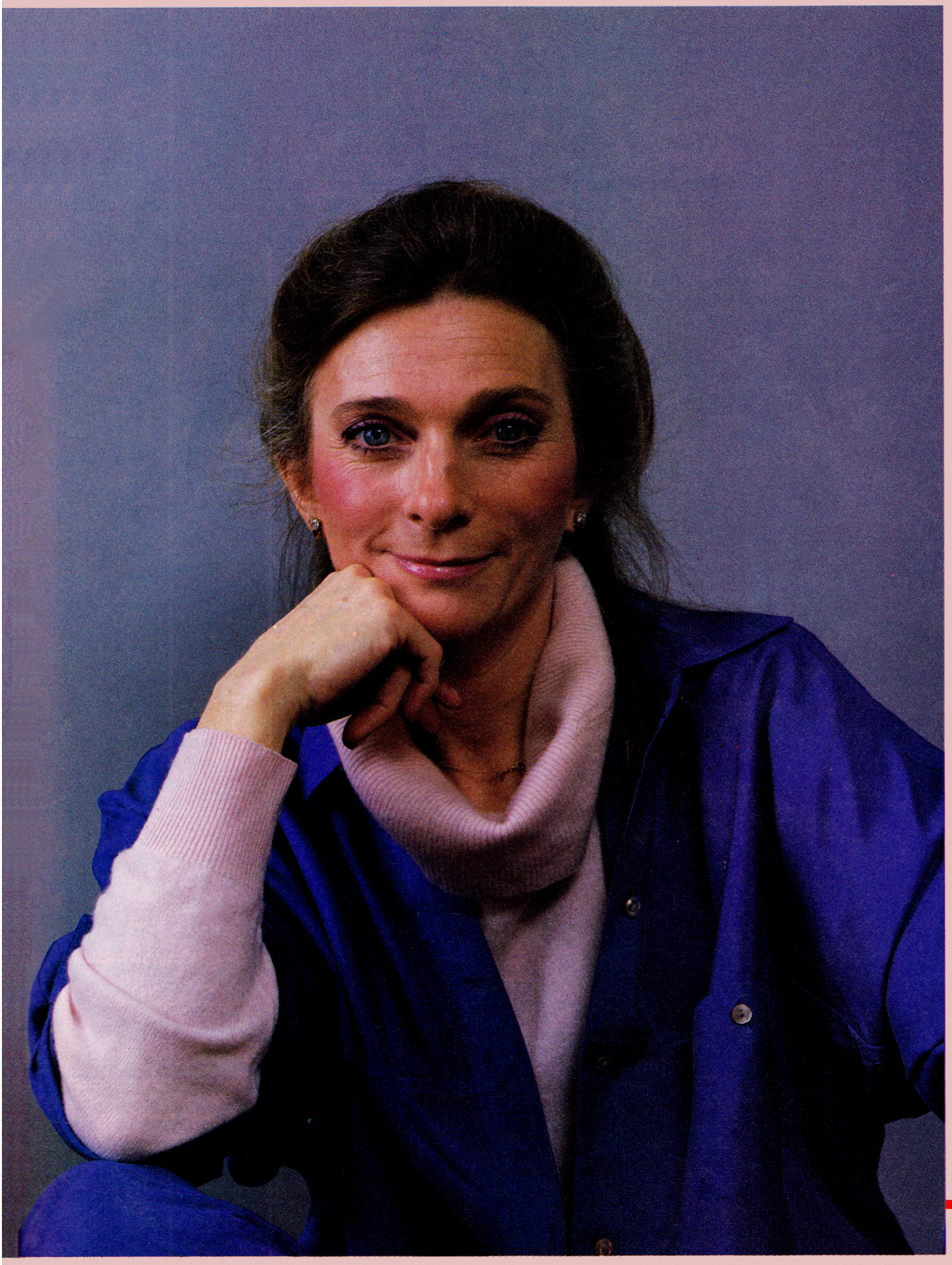
"I'm a mature adult. I didn't think that a computer would be something I would jump up and down and flip out about. I was always a bit shy—no, very shy—about computers.

"I went to a computer class one weekend—became familiar with the keyboard, learned a few orders. . . ." When you talk with a creative person about computers, half the fun is hearing her create her own language—"orders" are programs.

Judy overcame her shyness quickly. And quickly learned to have a lot of fun with AppleWorks and the //c while increasing her personal productivity.

**"Give Me the Apple. . ."**

Judy Collins has been an Apple enthusiast for more than a year now. What pulled her in that direction was the prospect of managing all the material for her autobiography. She wanted to make that writing task easier with word processing. "At the end of '84 I had committed myself to this book I had been thinking about for a number of years. In December while I was getting my Christmas presents, I called my brother, who has written a lot of long academic books. He recommended the Apple because of its computer-friendly—no, I mean user-friendly—features. AppleWorks was especially friendly, and he knew I wanted to be working on a book."



She laughs as she remembers buying her computer: "So I went to Bloomingdale's at Christmas, and I said, 'Give me the Apple and everything that goes with it, please.' " Judy throws her long hair over her shoulder and covers her eyes with her hand in mock horror—or shyness perhaps.

At Christmastime in 1984 at Bloomie's, the //c and "everything that goes with it" meant a 128K machine, monitor, ImageWriter printer, and AppleWorks.

"It was about three days before I felt fully comfortable," Judy recalls. But "AppleWorks and the //c were so friendly that I could really get along with them right away."

As she became more involved with AppleWorks, she found the software willing, but the hardware weak. "I looked around me and saw that I had 52K in my desktop. Up to now we're fine and we love AppleWorks. Now, I still love AppleWorks. But I had a desire to have more power and yet stay with AppleWorks. I didn't want to learn another program, and I didn't want to change all my disks."

Judy needed to have more of her writing available for split-screen editing functions, as well as increased speed when switching between versions. This time, instead of Bloomingdale's, she turned to magazines to research the hardware support she needed and found two hardware solutions. She added "something called a Quark," the 10-megabyte hard disk—she says the word like someone reading *Finnegans Wake*—and a Z-RAM card from Applied Engineering. True to her independent and creative nature, she added both hardware upgrades by herself, with only a moderate amount of telephone support.

### Falling in Love

Now, while Judy is very happy with her system, she doesn't recommend it to everyone. "It puts you into a very personalized and eccentric position. It's as though you have a BMW and you buy all the parts from a Rolls Royce and put them into it. But that's what happens when you fall in love with a program."

And like love, which needs constant attention, AppleWorks wouldn't work for Judy if it weren't fun. "The thing I think is the best-kept secret about computers, and the reason I agreed to talk to *inCider*, is that they're so much fun. I find myself in here talking to my computer and having a wonderful time. There's something very amusing and delicious about getting involved.

"Part of the folklore of the computer age is that you don't know much about what you really need until you get your hands on a computer—then you begin to see what you have or have not got."

That's why Judy believes it's so important for everyone to create his or her own "eccentric" system. At the outset, "I didn't know what I needed," she says. But by using an expandable Apple computer and a complete, integrated software package like AppleWorks, she was able to grow with her needs.

In the process of writing a 1200-page manuscript, a work that tells the story of Judy's life, and maybe something of the story of the '60s and '70s as well, "AppleWorks and the Apple //c have been a sort of encouraging friend." As for AppleWorks' spreadsheet and data base, "I've played with them and had fun with them," she says.

So much fun, in fact, that the Apple //c and AppleWorks are finding their way into more of Judy's life than just her autobiography. Judy's personal assistant recently received her own Apple //c and AppleWorks and has created a data base of information on each of Judy's performances. And she can transmit the data directly to Judy's system. Judy has also taken to the road with a Radio Shack Tandy Model 200 to continue working on her autobiography. She sends that material to her assistant's Apple //c and finds it translated to her AppleWorks disks when she returns home.

Judy will finish her book this year, without the aid—and maybe the confusion—a ghost writer might bring to a less independent star. But Judy has already "torn off in other directions—poetry and songs—or at least logging ideas for poetry and songs." She admits she still enjoys some creative writing with a tech no higher than a number two pencil. But she likes to edit even her journals, poems, and new songs with the computer.

**"I hope that we can be as good as our computers. . ."**

### A Force for Each of Us

Like many converts, Judy has become something of a proselytizer. "It interests me when people aren't interested at all. They're afraid of computers. You don't have to be an expert—you don't even have to do anything very complicated—to have the pleasure of this kind of connection with sources of information, people, and ideas."

Judy Collins says the computer in our homes can be a powerful force in our lives—and make each of us a success. "I hope that we can be as good as our computers, that we can be up to presenting them the problems they can solve, because they can solve a lot of problems, in a worldwide sense, and give us some answers to questions that need answers—if we're willing to think about them." ■

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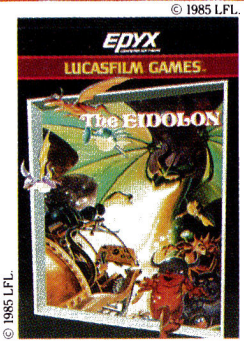


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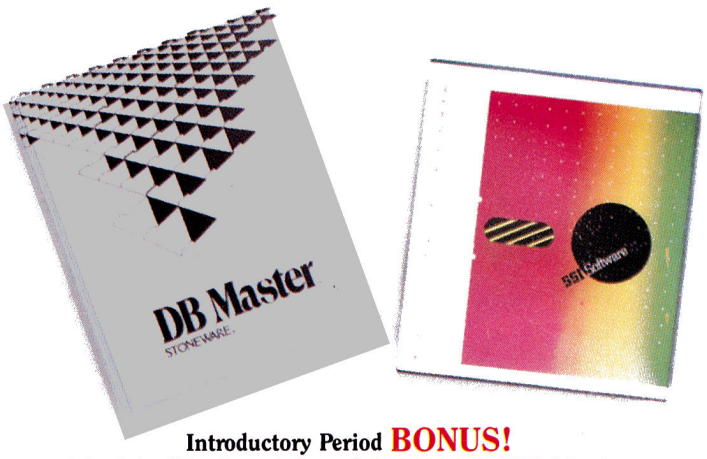


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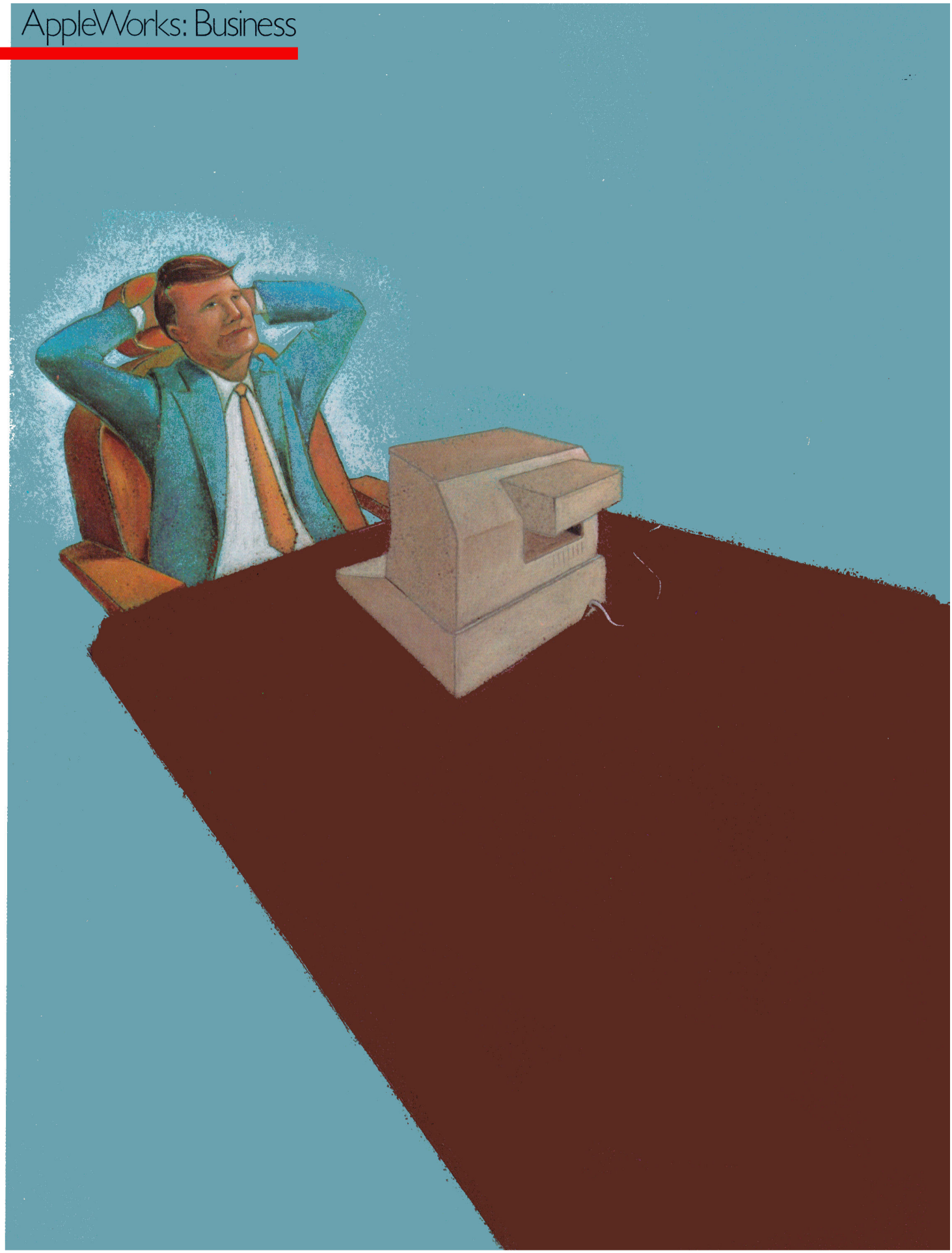

# Success Stories

*Starting a business? Teaming up with AppleWorks may be your key to success.*

by Archie Mason

If you're thinking of running your own small business on your Apple II and using your home as the office, you should consider AppleWorks, the best-selling software program in the country—almost a million copies to date. You won't see it on Softsel's "Hot List" because it's distributed only by Apple Computer. But if Softsel had it, it would be the runaway top seller every week. And for good reason—AppleWorks is a very easy-to-use integrated software program that includes word processing, a data-base manager, and a spreadsheet.

Teaming AppleWorks with a memory-enhanced Apple II, a desktop-accessory program, a spelling checker, a good printer, and perhaps a hard-disk drive can lead to a successful small business. In our example, you'll see how one couple, John and Shirley, each develop a computer system with AppleWorks-compatible products to meet their particular business needs.

Using primarily AppleWorks on the Apple //e, Shirley successfully launches a home-based professional word-processing business for less than $4000 (without a hard disk). And by making use of Shirley's equipment and adding a few new applications such as Pinpoint and Quicken, John found he was able to do the bookkeeping for his manufacturers'-representative business in only a few hours instead of a full day (usually on the weekend). In their stories, you may spot some challenges that are similar to certain business situations you're experiencing. Their solutions will suggest solutions for you, too.

## Author, Author

Services to authors are the focus of Shirley's specialized word-processing bureau, and her customers include several writers, ranging from free-lance magazine journalists to university professors to an author of paperback novels. And she's taken on other tasks, too—she does the bookkeeping for one young free-lancer and accounting for a small mail-order company. In fact, Shirley's almost a "mini service bureau"—she does the firm's payroll, too.

Once Shirley had decided to start her own business, her first task was to develop a needs analysis to design a computing system. She drew up a description of the functions she wanted to offer her clients:

- Word processing

—management of long manuscripts, most of them relatively uncomplicated in format and layout

—spelling and style checking, as part of a proofreading service

—production of draft copy at high speed coupled with production of letter-quality final text

- Data processing

—simple bookkeeping (such as checkbook balancing), as a service to writers

—maintenance of a reference-index data base

—Shirley's personal bookkeeping (invoicing, accounts receivable, and general ledger)

After the analysis and several consultations with computer-store personnel and other small-business owners, Shirley decided to enhance her //e with an Apple memory-expansion/80-column card, two 5¼-inch floppy-disk drives, and **AppleWorks** integrated software. She chose a **Diablo 630** letter-quality printer, as its daisy-wheel print head lets her offer her customers a variety of typefaces and, of course, attractive hard copy. For higher-speed, dot-matrix output, Shirley added an **IDS Prism**. A **Business-Card** multifunction I/O board from Street Electronics (see "A Card for All Reasons" in the February 1986 *inCider*, p. 38) gives Shirley a built-in clock and extensive printer-interface capabilities, including parallel or serial transmission, optional print buffer, and hi-res graphics-screen printing. Shirley was able to get rid of her individual printer cards and consolidate her printing with this one board.

Shirley also recently bought a **Sider II** 20-megabyte hard drive from First Class Peripherals to handle the special needs presented by a university professor who's preparing an historical treatise. When it's published, the book will be more than 1000 pages long, with a detailed, cross-referenced index. The professor delivers his text in unrelated pieces as he completes each area of research and writes the corresponding text.

Shirley quickly realized that working on a series of floppies was going to be a nuisance. She found that at any one time she had as many as ten or 12 chapters "open," either in progress or awaiting some reference material or editing by the author. The professor also relied on Shirley to note cross-references to other parts of the manuscript, so Shirley continually needed to jump around within the text, a real pain on multiple disks.

The analysis part of the problem was easy: Shirley needed a large-capacity disk that would be easy to back up, quick to move around on, and very, very reliable. After reviewing the options at several different computer stores, Shirley settled on the Sider II. Once she installed the unit, she developed a working procedure that's efficient and time saving.

Shirley keeps the book's segments on several floppies, carefully labeled and indexed. Whenever new text comes in, she reads it and finds out which segments she'll need to access. She copies the contents of the floppies onto the Sider and starts editing. When she's done, she sends the edited text back to the appropriate floppy—to ensure that the most current version of the manuscript is safely on disk.

Why keep running the text in and out of the hard disk? Simply, all the material for each of Shirley's many current projects does not have to be available all the time. The only data she uses almost every day, and therefore maintains permanently on the Sider, are John's business records and her own bookkeeping. She backs up this information on floppy disks, but never erases it from the Sider.

Shirley decided to enhance her word-processing business with proofreading, including spelling verification. Shirley needed spelling-checker software and felt that **Sensible Speller** would be a good investment. The package has 80,000 words (thanks to the *Random House Dictionary*) and lets you add any unique terms you'd like. In addition, it can check any ProDOS file of any length, regardless of the specialized nature of the contents.

Shirley's financial services are secondary to her word processing, but for some of her authors very basic financial management was an added bonus she was easily able to offer with AppleWorks and its integrated spreadsheet and data base.

One of her clients, a free-lance writer, had little business sense and couldn't manage her due dates or fee collection. Using the AppleWorks data base, Shirley tracks all of the writer's output from first agreement to payment. When she receives an assignment, the writer brings in the notes and drops them on Shirley's desk. Shirley creates a data-base record containing the details of the piece, working title (often just one word for reference), a descriptive sentence, the name of the publication, deadline, and fee. Shirley's data-base system also includes a master list of the publications for which the author works, including phone numbers, addresses, and editors' names.

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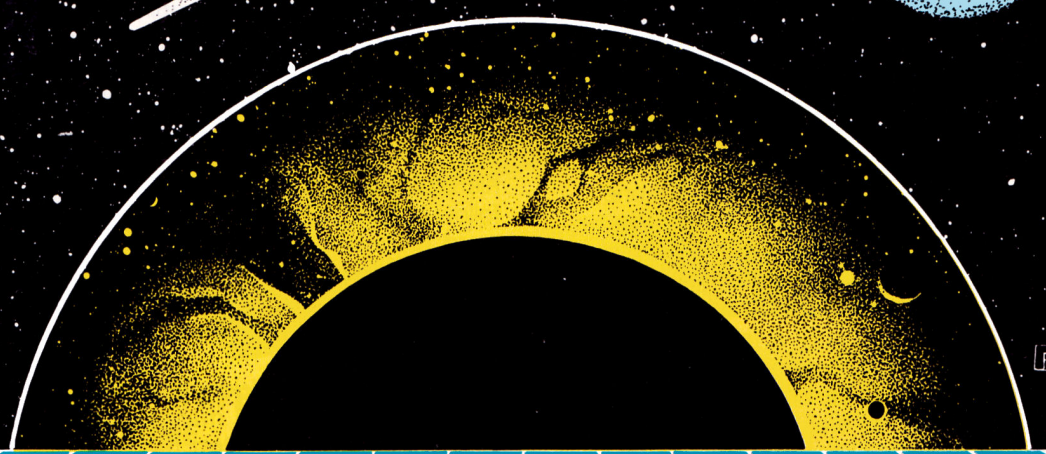

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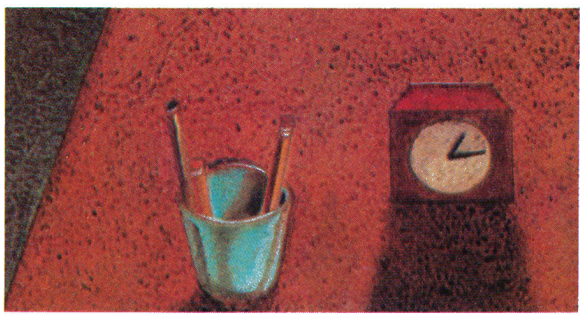
Circle 15 on Reader Service Card.

Shirley records the milestones of each assignment—first-draft dates, receipt of author's proofs, and so on—and finally she makes sure the writer gets paid. Since fees are often due only on publication, a long time may elapse between acceptance and payment. Shirley's system ensures that her client's fee isn't forgotten.



To help the author with her billing, Shirley uses the information from the data base to set up a simple spreadsheet. The author writes her own checks, but turns the stubs over to Shirley for entry into the system. She also handwrites invoices and similarly gives Shirley a copy of each after she mails it. Shirley just organizes the data: She allocates the various checks to accounts, so that the author knows how much she's spending on various overhead items (phone calls, supplies, messengers, and so on), and she types in invoices so the author will know who owes her money, how much she's earned, and who her best customers are.

Thus with AppleWorks and only a few other peripheral products, Shirley has created a unique word-processing service that can handle the demands of full-book typing as well as smaller manuscript jobs. Her special ability to offer simple bookkeeping plus proofreading makes her service stand out from the rest.

### A Business on the Move

John is a manufacturers' rep, an independent salesman who carries the lines of several different companies, all of which are interested in selling to a defined group of customers—in John's case, jewelry stores. John's territory includes his home state and three bordering states, and he spends about three days a week on the road. He represents three fashion-jewelry firms, a watch manufacturer, a brand of silver polish, and a large flatware company.

A manufacturers' rep is a unique kind of business professional. While most reps are unincorporated, their business affairs have all the characteristics of a small company. Reps have inventories to manage (in John's case, valuable samples, plus some full product lines), expenses, accounts receivable (the commission manufacturers owe him on the sales John made for them)—and, of course, they must pay income tax. When John returns from a usual three- or four-day trip he still has several hours of work to do—expenses to account for, sales orders to transcribe and send to manufacturers, commission statements to check, letters to write, and the ever-present inventory control of his own stocks of products.

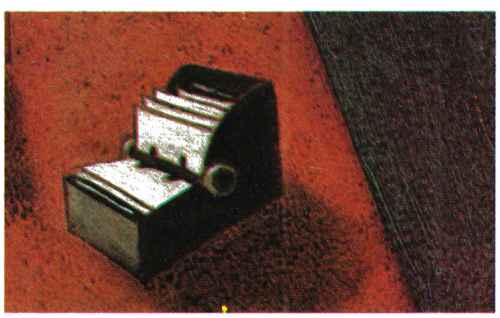
John's business activity was a natural for computerization, and realizing what Shirley was accomplishing in her business spurred him on. First, however, John drew up a conventional needs analysis before deciding if he should look into any special equipment or software. He reviewed in depth the kinds of work he was doing manually and examined what he wasn't doing at all because it was too much trouble. John's list of requirements included the following features:

- Out-of-pocket-expense management—the ability to keep track of disbursements and claim reimbursements, plus maintenance of categorized records for tax purposes
- management of two types of inventory—demonstration merchandise and samples, and the deliverable consignment merchandise for which payment will ultimately be made directly to the manufacturer
- commission records—logging orders, commissions due and received, and estimates of future income
- simple word processing, mostly form letters
- an appointment diary with follow-up calendar

Standard bookkeeping application packages, such as general ledger, accounts payable and receivable, and so on, would be overkill. John realized that nearly all his needs could be met with just one program—AppleWorks. The spreadsheet and data-base manager handle all the information he needs to run his day-to-day business and to maintain records for follow-up and preparation of tax returns. AppleWorks word processing is good for his correspondence, memo writing, and form preparation. The letter-quality and dot-matrix printers had already been identified for Shirley's needs, so John needed no additional hardware.

John's analysis did identify needs that more dedicated programs would manage more efficiently than AppleWorks—but one firm requirement was that additional programs must be completely compatible with AppleWorks, so that John could pass data back and forth.

John's task was to find a simple bookkeeping package, mostly to manage accounts payable. Its essential characteristics, in addition to AppleWorks compatibility, would have to be checkbook/bank-account management and categorization of expenditures by type.



NEW LOW PRICE

# THE X-10 POWERHOUSE DOES EVERYTHING BUT PUT OUT THE CAT.

Model CP290

## THE X-10 POWERHOUSE INTERFACES WITH YOUR APPLE TO CONTROL YOUR HOME...FOR SECURITY, COMFORT AND ENERGY SAVINGS.

This remarkable Interface lets you run your home through your Apple IIe or IIc and a mouse, keyboard or joystick.

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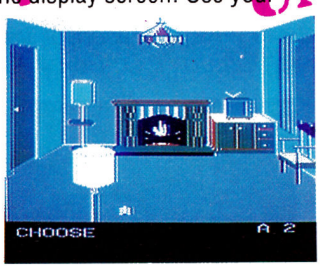


**THE WAY IT WORKS.** The X-10 Powerhouse Interface is cable-connected to the Apple RS-232 port and plugged into a standard 110V outlet. After it is programmed, the Interface sends digitally encoded signals through your home wiring to special X-10 Modules. To control a lamp or appliance, you simply plug the electrical device into a Module and then plug the Module into an outlet. The Interface can control up to 256 Modules throughout your home and won't interfere with normal use of lights and appliances.

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Circle 169 on Reader Service Card.

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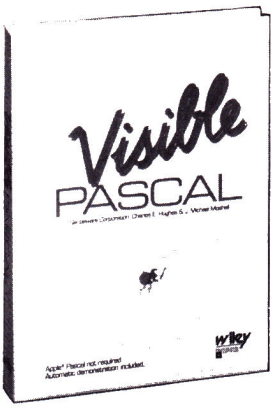


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*The New York Times*
*August 6, 1985*

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**Requirements:** Apple® II, (with language card), II+, IIc or IIe, 64K RAM. Game paddles or joysticks recommended, though not required except for the Artist program.

Examine the documentation only FREE for 15 days. Either keep your **Visible PASCAL** and return the accompanying invoice with your payment (including postage and handling, plus local sales tax) or return it within 15 days without further obligation.

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Enter **Quicken** from Intuit. This neat program is easy to learn and provides exactly the level of bookkeeping a one-person business needs. It can manage more than one bank account, and can be programmed to prepare checks for regular payees. Intuit can also supply pinfeed checks and window envelopes to further reduce the work involved in paying bills.

One of Quicken's most convenient features is its ability to create account categories "on the fly" as you build your money-management system. Many other bookkeeping programs force you to almost fully design a chart of accounts right at the beginning, and they're awkward to edit.

So John has virtually a "one-write" system—an application that lets him simulate check writing (the screen even looks like a check), then print it, and have the software take care of everything else. He can run the data he's created into AppleWorks for all kinds of useful purposes.

Since John's territory is large and he spends three or four days each week on the road, it's important to plan trips efficiently. He needs to be able to look at three- or four-day periods so that he can make effective appointments.

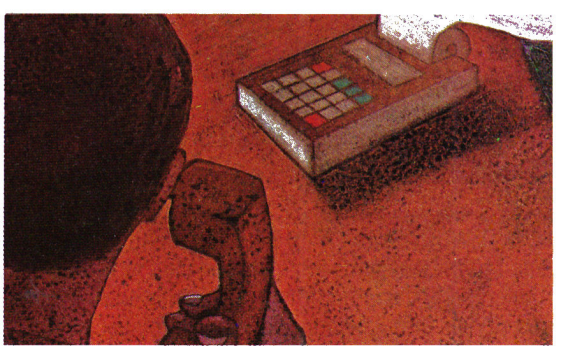
John found **Pinpoint**, from Pinpoint Publishing, a memory-resident background-mode program you can call at any time from within virtually any program. It can be easily installed with AppleWorks. Pinpoint's calendar-management segment is well suited to John's requirements. Whenever you ask to review in detail any single day, Pinpoint also displays a summary of the two succeeding days, together with the calendar for the month.

One bonus John got when he selected Pinpoint was the variety of extra features that come with the program. The telephone directory and auto-dialing system, for instance, inspired John to acquire a Hayes Smartmodem (which connects to the Business-Card's serial interface)—and Pinpoint contains the communications software he prefers. The Pinpoint calculator is very useful for those quick computations that are just a nuisance if you have to boot up a spreadsheet. And Pinpoint's ability to use the Apple as a memory typewriter is a boon when you're in a rush and don't want to create a document.

So John manages his business with just three programs, and has reduced his post-trip workload from a full day to just one evening. ■

---

*Write to Archie Mason at InterCalc Spreadsheet Users' Group, P.O. Box 4289, Stamford, CT 06907.*



# Want More AppleWorks™ Power?

You could put an Apple™ 1 meg memory expansion card in slot 4 and add another Apple 1 meg memory expansion card in slot 5 (Apple's card only expands to 1 meg). You'll need a separate 80 column card for the auxiliary slot. Oh, and put a printer buffer card in slot 2. If you want RGB color, you'll need an RGB board in slot 7 then buy a hard disk (if you have any slots left).

You'll have a bigger AppleWorks desktop, but you'll still be limited to a maximum of 1350 records in the data base. And you're stuck at 2250 lines in the word processor. And AppleWorks won't automatically load itself into memory, and make sure you don't create a file bigger than your disks can hold because Apple's memory card won't segment a file onto multiple disks.

## Or
## You could get RamWorks II®!

*You'll have a bigger desktop.*

You'll also have up to 15,200 records (not 1350) in the data base and up to 15,200 lines in the word processor (not 2250). AppleWorks will now automatically load into RAM. And if you create a file greater than your disk capacity, no problem. RamWorks II will automatically save it on multiple disks. And because of our built-in printer buffer, you can continue to use AppleWorks while your printer is printing. Nice. RamWorks II has an RGB option, 16 bit option and is expandable to 3 megabytes. And don't forget, RamWorks II is the software industry standard for memory expansion in the IIe. RamWorks II is automatically recognized by virtually all memory intensive programs (and many more are on the way) and is 100% compatible with all IIe software and hardware. So save your money and save your slots for other peripherals. Order RamWorks II today! Want more info? Just turn the page.

AE™

**APPLIED ENGINEERING**
**"We Set the Standard"**

| | RamWorks II® | Apple's™ Card |
|---|---|---|
| Maximum Desktop | 2277K | 1012K |
| Maximum Number of Records in Database | 15,200 | 1350 |
| Maximum Number of Lines in Word Processor | 15,200 | 2250 |
| Autoloads AppleWorks | YES | NO |
| Auto Segments Files | YES | NO |
| Built-in Printer Buffer | YES | NO |
| Compatible With All Versions of AppleWorks | YES | NO |
| Displays Time & Date on AppleWorks Screen with Clock | YES | NO |
| Saves Slots | YES | NO |
| RGB Option | YES | NO |
| 16 Bit Co-Processor Port | YES | NO |
| Memory Expansion Port | YES | NO |
| Patent Pending Power-Saving Circuit | YES | NO |
| 80 Columns Built-in | YES | NO |
| CP/M RAM Disk | YES | NO |
| Compatible with Franklin 2000 Software | YES | NO |
| Maximum Total Functions | 6 | 1 |
| Software Standard | YES | YES |
| Manufactured in | USA | Singapore |
| Warranty | 5 years | 90 days |
| Price with 256K | $219 | $299 |

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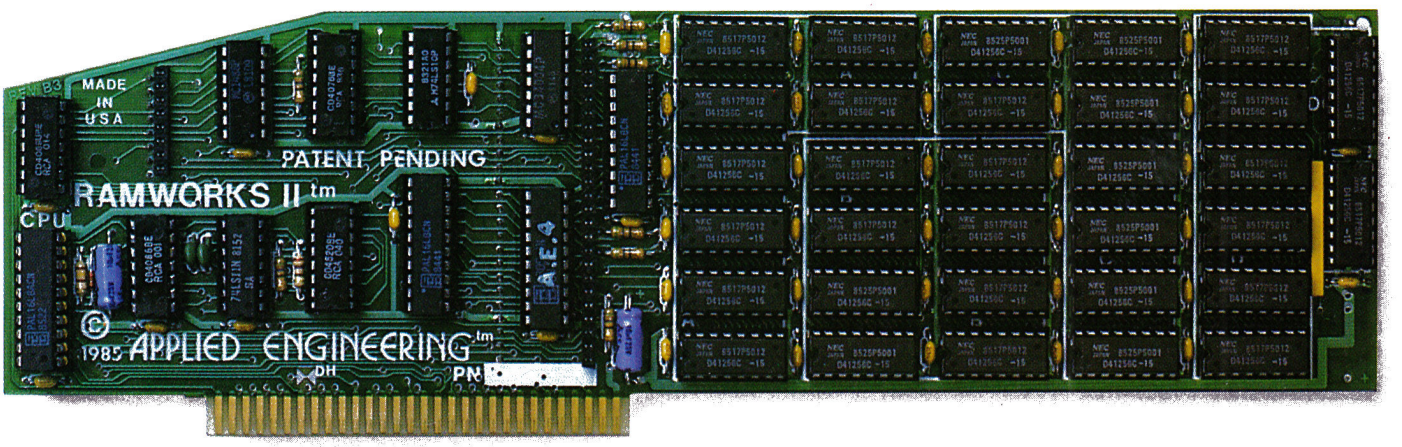
# Meet RamWorks II®

## *The Recognized Industry Standard For Memory Expansion of the Apple IIe.*




## *RamWorks II. A Generation Ahead. Again.*

The best selling expansion card for the Apple IIe just got even better. With RamWorks II, expand your IIe to an incredible 3 megabytes of usable RAM.

### Turbo Charged AppleWorks.

RamWorks II plugs into the IIe auxiliary slot and acts just like Apple's extended 80 column card, only better—because if you buy a 256K or larger card, AppleWorks will automatically load itself into RamWorks II. This dramatically increases AppleWorks' speed and power because it effectively eliminates the time required to access disk drive 1. Now, switch from word processing to spreadsheet to database management at the speed of light. AppleWorks responds the moment your fingers touch the keyboard.

But AppleWorks has certain internal limits, independent of available memory. Fear not. Only RamWorks II (and the original RamWorks of course) removes those limits. Only RamWorks II increases the maximum number of records available from 1,350 to over 15,000. Only RamWorks II actually increases the number of lines permitted in the word processing mode. And only RamWorks II features a built-in printer buffer, so you no longer have to wait for your printer to stop before going back to AppleWorks (256K or larger RamWorks II required).

With RamWorks II, you won't have to split your data into 2 or more separate files because you'll have the necessary memory to access ALL your data ALL the time, quickly and conveniently.

| RamWorks II | AppleWorks Desktop |
|---|---|
| 128K | 101K |
| 256K | 188K |
| 512K | 378K |
| 1 MEG | 758K |
| 1.5 MEG | 1136K |
| 3 MEG | 2277K |

### The Most Friendly, Most Expandable Card Available.

RamWorks II is compatible with more off-the-shelf software than any other RAM card. Popular programs like Advanced VisiCalc, Magic Office System, Flashcalc, The Spread Sheet, Diversi-DOS, Supercalc 3A, Magicalc, etc. (and hardware add-ons like Profile and Sider hard disks). Fact is, only RamWorks is 100% compatible with all software written for the Apple 80 column and extended 80 column cards. In addition, RamWorks II can emulate most other RAM cards, so you can use programs written for them without modification. And any size RamWorks II can be user upgraded later to any larger size.

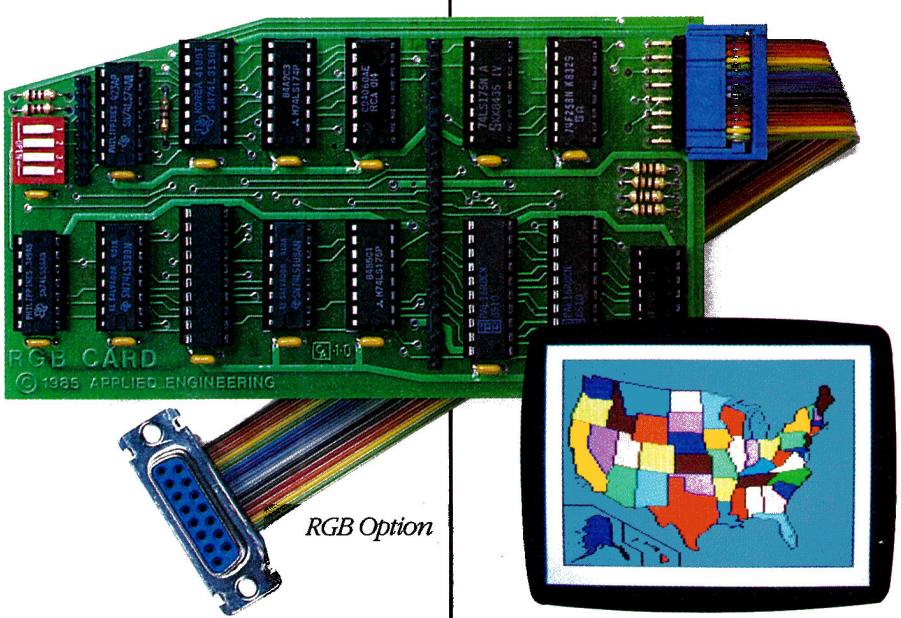
RamWorks II was designed so you could take full advantage of future developments in 16 and 32 bit microprocessors. As your needs grow, so can RamWorks II. A handy coprocessor connector allows the latest and greatest coprocessor cards to access all 3 MEG

of RamWorks II memory. And speaking of more memory, RamWorks II has a memory expansion connector on board so a low profile (no slot 1 interference) memory expansion card can add another 512K or 2 MEG of memory.

Unlike Apple's smaller, more expensive RAM card, RamWorks II plugs into the IIe auxiliary slot and therefore leaves slots 4 and 5 available for other peripheral cards.

## It's In Color

RamWorks II by itself is *fully* compatible with both the Apple monochrome and color monitors. But if you want better color graphics *plus* a more readable 80 column text (that blows away any composite color monitor) you'll appreciate our RGB color option. For only $129, it can be added to RamWorks II, giving you a razor sharp, vivid brilliance that's unsurpassed in the industry. The RGB option does not waste another valuable slot, but rather plugs into the back of RamWorks II with no slot 1 interference (works on the original RamWorks, too) and attaches to virtually any RGB monitor. And remember. You can order

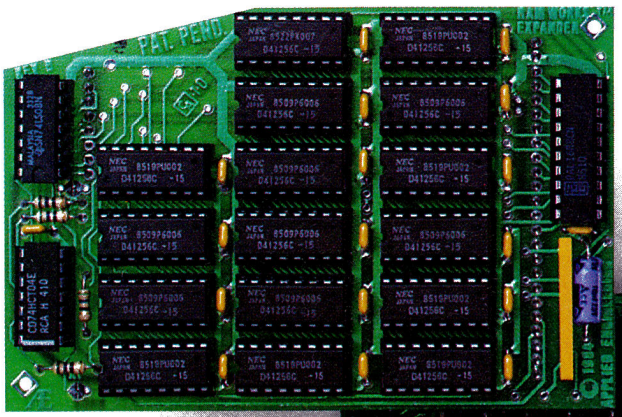



*RGB Option*

the RGB option with your RamWorks II. Or add it on at a later date.

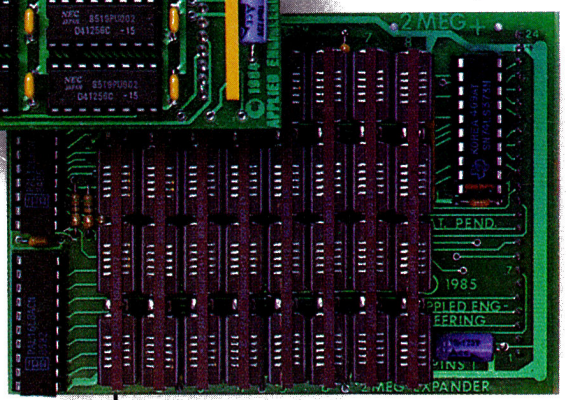
## It Corrects Mistakes.

Let's say you bought some other RAM card (and that's a mistake) and your RAM card is not being recognized by AppleWorks, Advanced Visicalc, Flashcalc, Supercalc 3A, or other programs, and you want RamWorks II.



*512K Expander*

*2 MEG Expander*




No problem. The memory chips on the card that you now have, which is where most of the money is, can be unplugged and then plugged into the expansion sockets on RamWorks II.

## It's Got It All.

- 15 Day Money Back Guarantee
- Super sharp 80 column text (patent pending) with or without RGB option
- Double high resolution graphics (with or without RGB option)
- Expandable up to 1 Meg (1024K) on main board
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- Can use 64K or 256K RAMS in any combination
- Linear addressing coprocessor port
- Automatic AppleWorks expansion up to 2277K desktop
- Accelerates AppleWorks
- Built-in AppleWorks printer buffer
- The only large RAM card that's 100% compatible with all IIe software
- RamDrive ™ the ultimate disk emulation software included free
- 16 Bit option
- Compatible RGB option
- Built-in self diagnostics software
- No slot 1 interference
- Lowest power consumption (patent pending)
- Takes only one slot (auxiliary)
- Software industry standard
- Advanced Computer Aided Design
- Used by Apple Computer, Steve Wozniak and virtually all software companies
- Displays date and time on the AppleWorks screen with any PRO-DOS compatible clock
- 5 Year no hassle warranty

| | |
|---|---|
| **RamWorks II with 64K** | **$ 179** |
| **RamWorks II with 256K** | **$ 219** |
| **RamWorks II with 512K** | **$ 269** |
| **RamWorks II with 1 MEG** | **$ 389** |
| **RamWorks II with 1.5 MEG** | **$ 549** |
| **RamWorks II with 3 MEG** | **$1699** |
| **RGB Option (may add later)** | **$ 129** |
| **16 Bit Option (may add later)** | **$ 89** |

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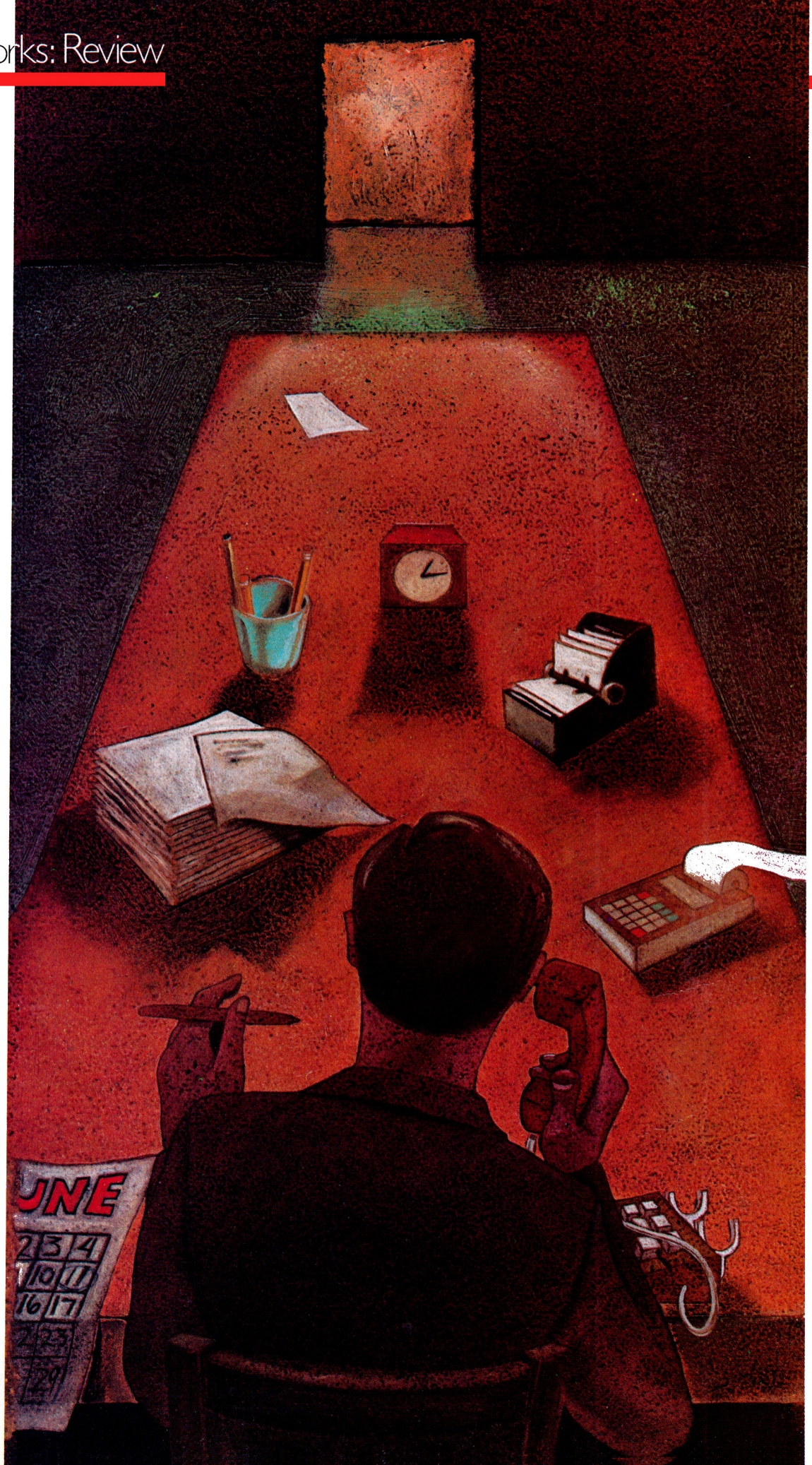
JNE

*Which accessory package should you choose? Here's a comparison of Pinpoint and Jeeves, two of the newest.*

# Desktop POWER

by Tom Sherman

There are three types of software: programs that frustrate you, programs that satisfy you, and programs that are so good you always want more. AppleWorks is the third kind. Because it does so many things so well, AppleWorks makes me wish for just a few more—like a calendar, clock, notepad, and calculator.

When the Jeeves and Pinpoint desktop accessories were announced, I placed my order, enhanced my //e in anticipation, and crossed my fingers. Will life be better with Jeeves? Will Mac and IBM users squirm when they see Pinpoint? If your calculator is always across the room, if you write notes to yourself on the inside of disk envelopes, if the sun comes up before you look at your watch, you definitely need help getting organized—but which package should you choose?

That's hard to answer. Your decisions will depend on your needs, your equipment, and your patience. Both Jeeves and Pinpoint operate with AppleWorks in memory. They have four features in common—a notepad, calculator, appointment calendar, and telephone dialer. Jeeves also has a software clock and an alarm clock. Pinpoint offers telecommunications, graphics/text merge, envelope labeling, and a "typewriter" connection to your printer. Let's examine the four functions they share, then look briefly at their unique features.

## The Basics

Pinpoint's notepad may have a slight edge over Jeeves' because it works like a mini-AppleWorks and creates larger files (2000 characters versus 600). Jeeves' notepad, though lacking word wrap, has additional commands—to clear or restore a line, for example. Jeeves gives you the same notepad every time to edit as necessary. Pinpoint saves and recalls notes under different names.

Jeeves' calculator has the upper hand, because it lets you type in and edit simple equations, and it's easier to see how you got your results. The Pinpoint calculator accepts larger numbers, though (16 characters versus ten). Unfortunately, you can't "cut" the results from either calculator to "paste" into your text.

The Jeeves appointment book provides one big benefit—it automatically arranges times of day if you type them in military-fashion. Pinpoint, on the other hand, has many smaller advantages, such as showing you four months at a glance rather than three, highlighting days with appointments, and copying or moving entries from one day to another. And Pinpoint prints only the calendar days you choose, while Jeeves prints the whole screen.

The Pinpoint dialer automatically highlights the first telephone number on the screen. Use the cursor keys to move to other phone numbers and dial the one you select with the return key. Jeeves lets you create a 1K phone book with automatically alphabetized names and numbers, then dials from that list.

## Extras

Only Jeeves includes a clock and alarm. If you don't have a clock card, type in the date and time to set the alarm and stamp your ProDOS files.

The remaining four functions mentioned above—Communications, GraphMerge, QuickLabel, and Typewriter—are exclusively Pinpoint's. Communications lets you choose 300 or 1200 baud, set other protocols, and send or receive files. Pinpoint's Communications isn't a full-featured program—it doesn't permit interactive log-on, for example—but it's an excellent value as part of the whole package.

Pinpoint's GraphMerge makes it easy to merge and print graphics files with AppleWorks files. You can convert

hi-res MousePaint images to double high resolution, you can divide the height and the width of the image in half, and print in regular or inverse format.

When you've finished your letter and printed it, you don't need to retype the name and address on the envelope. Pinpoint's QuickLabel feature can recognize a block of text as an address, let you adjust the size of the block, and position it on the image of an envelope. Press the return key and the envelope is printed.

If your typewriter is buried in the closet under the suitcases, you'll enjoy being able to type and print a line at a time directly from the keyboard. Typewriter is quicker than the E(nter) K(eyboard) option in AppleWorks, and it's easy to set the type size, lines per inch, and style (normal, bold, italic, or headline) on your Apple ImageWriter, Scribe, or DMP. (Additional printer drivers on a separate disk should be available soon.) Be careful, though—the program doesn't return your printer to its standard mode when you exit.

## Comparing Speed

Are you a patient person? If your system doesn't include a hard disk or RAM-expansion board, you'll find Jeeves significantly faster. Simultaneously pressing the open-apple and solid-apple keys instantly brings Jeeves into service. And Jeeves can retrieve data files from disk long before you can get across the room to that calculator.

I tested Pinpoint with regular Apple II disk drives, a ProFile hard-disk drive (see "Hard-Driving Disks," September 1985, p. 24), and Applied Engineering's excellent RamWorks card (see "Thanks for the Memory," December 1985, p. 18). Pinpoint's manufacturer candidly and accurately says the program is "much more useful" with a hard disk or RAM-expansion board.

Loading the Pinpoint calculator from a floppy disk takes almost 20 seconds. But fetching the calculator from a hard disk takes about seven seconds, and retrieving it from the memory-expansion board takes only one second. The larger Pinpoint accessories—telecommunications and graphics/text merge—show similar savings: 30 to 60 seconds to load from floppies, less than ten seconds from the RAM board. If you're impatient and your system is small, you'll be gnawing on your knuckles before you get to enjoy Pinpoint.

## The Bottom Line

Both programs include tutorials on disk and accompanying manuals, but the similarity ends there. Jeeves provides minimal documentation, which may be all that's required for experienced AppleWorks users. Its awkwardly organized 39-page booklet is crammed with small print and typos. Pinpoint, on the other hand, offers a well-designed book of 213 pages, many with sample screens to illustrate the text. These detailed instructions will certainly satisfy AppleWorks beginners.

Which accessory package should you choose? I like the Jeeves alarm clock, and the automatic sorting in the program's appointment calendar and phone book. If I didn't have a memory-expansion board, I'd pick Jeeves for speed. But with all its functions loaded on a RAM card, I'll take Pinpoint. And because I use my modem often, Pinpoint's communications feature confirms my choice.■

*Tom Sherman is a business consultant, free-lance writer, and networking enthusiast. Write to him at 224 South Chester Road, Swarthmore, PA 19081.*

# AppleWorks:

## Product Information

**AppleWorks**
Apple Computer
20525 Mariani Avenue
Cupertino, CA 95014
(800) 538-9696
$249
**Reader Service Number 305**

**BusinessCard**
Street Electronics
1140 Mark Avenue
Carpinteria, CA 93013
(805) 684-4593
$219.95 (serial)
$249.95 (parallel, with cable)
**Reader Service Number 306**

**Diablo 630**
Diablo Systems
901 Page Road
Fremont, CA 94537
(800) 556-1234
$2295
**Reader Service Number 307**

**IDS Prism**
(Now called the Prism)
Data Products
Route 13
Milford, NH 03055
(603) 673-9100
Prism 132 $1995
Prism 80 $1795
132 Basic $1499
80 Basic $1299
**Reader Service Number 308**

**Jeeves**
PBI Software
1155B-H Chess Drive
Foster City, CA 94404
(415) 349-8765
$49.95
**Reader Service Number 309**

**Pinpoint**
Pinpoint Publishing
2823 Steinmetz Way
Oakland, CA 94602
(415) 530-1726
$69
**Reader Service Number 310**

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2525 West Evans
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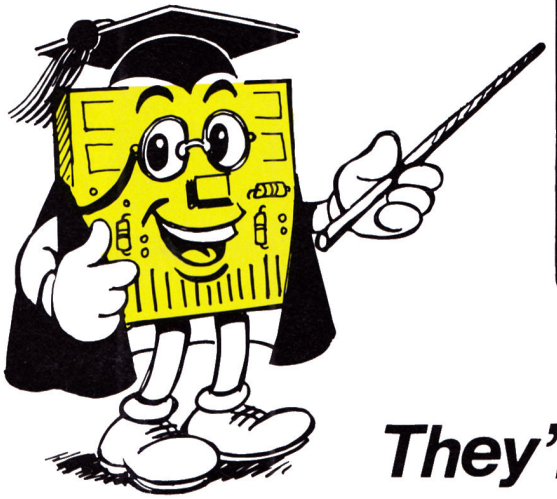

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| Fits in any standard slot | YES | YES | NO | NO |
| Maximum memory without add-ons | 1024K | 256K | 512K | 768K |
| Total memory possible | 6MB | 6MB | 3MB | 1.5MB |
| Automatically recognised by ProDOS, CP/M+ and PASCAL 1.3 | YES | YES | NO | NO |
| 100% compatible with all standard Apple II software | YES | YES | NO | NO |
| Patch necessary for ProDOS (inc. APPLE-WORKS), DOS 3.3 and PASCAL 1.3 | NO | NO | YES | YES |
| ProDOS, DOS 3.3, PASCAL 1.3 and CP/M bootable direct from the RAMcard | YES | NO | NO | NO |
| Free support for CP/M 2.20B/2.23 and PASCAL 1.1/1.2 | YES | NO | NO | NO |
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ACE 2200

# FRANKLIN Clones the //e

*Apple compatibility, an IBM-like keyboard, and a lower price tag make the Franklin Ace 2200 a serious alternative for the experienced //e user.*

by Bob Ryan

Franklin, the New Jersey company that made its mark selling Apple II Plus-compatible machines, recently introduced its first line of new products in two years, the Franklin Ace 2000 series—Apple //e-compatible computers. The machines' appeal is to experienced users—people who will buy an Ace because it runs the software they need, people who already know that it doesn't run everything under the sun. The Ace computers are Applesoft-compatible and, yes, they run AppleWorks and SuperCalc3a. But, since the machines aren't 100 percent Apple-compatible, novices and casual users should steer clear of them.

Three machines comprise the Ace 2000 line: the 2000 itself, which comes without disk drives, the single-drive Ace 2100, and the twin-drive Ace 2200. I evaluated the 2200, but what I discovered applies to the 2000 and the 2100, as well.

## Features

Designed to be compatible with the Apple //e, the Ace 2200 runs much //e software and works with many //e peripherals. The 2200 uses the 65SC02 processor, a close relative of the 65C02. It has 128K bytes of RAM, BASIC in ROM, a built-in 80-column by 24-line video display, double hi-res graphics, and even mouse characters in ROM. In addition to these and other standard features, the 2200 offers a number of optional features, some of which are unavailable for the //e.

## The Keyboard

The Ace 2200 features a detachable keyboard with 90 keys, including a numeric keypad (which simplifies spreadsheet entries and BASIC editing), 12 function keys, and open-F and closed-F keys, which are analogous to the //e's open-apple and solid-apple keys (see **Photo 1**). The locations of some keys

(particularly the F keys) vary from those on the //e keyboard, but I got used to the new layout quickly.

I like the feel of this keyboard. In fact, the only thing I dislike about it is the small size of the key caps on the control, shift, and return keys. According to Franklin, these keys will be enlarged on the next version of the keyboard, which is due with the 5001st Ace 2000 machine. [*Editor's note: This keyboard was scheduled to be shipped in January 1986.*]

## The Video Signal

Like the //e, the Ace 2200 puts out a composite video signal. The 2200 has the same display modes as the //e—40- and 80-column text and lo-res, hi-res, and double hi-res graphics. The shape of the text characters

*Photo 1. The Ace 2200 keyboard.*

is slightly different from that of the characters a //e produces, but it's no better or worse. The 2200 has a 24-pin block connector on the motherboard for an optional RGB interface, which at press time was scheduled for release in January 1986.

The 80-column firmware in the Ace 2200 is a superset of the //e's Enhanced Video Firmware, and performs all the same functions. It also supports the functions of the 2200's six editing keys (see **Table 1**), which simplify the editing of BASIC programs.

## The System Unit

The system unit of the Ace 2200 houses two half-height disk drives, power supply, and motherboard. You can use the drives as 35-track drives under DOS 3.3 or ProDOS, or as 40-track drives under FDOS 2, Franklin's DOS 3.3-like operating system. The disk controller is built into the motherboard.

You can boot the Ace 2200 with DOS 3.3, ProDOS, or FDOS. When you boot the machine with FDOS, the computer automatically defines the function keys as 12 common FDOS commands (see **Table 2**), such as CATALOG,D1 and PR#1. You can also define the function keys yourself from BASIC. With the exception of function keys 7 and 8 (the COPY and TYPE commands), the predefined function keys are also available if you warm-boot a DOS 3.3 disk from FDOS.

| Key | Function |
|---|---|
| CLRS | Clears the screen and moves the cursor to the home position |
| HOME | Moves the cursor to the home position |
| CLRL | Clears the line the cursor is on |
| INSC | Inserts a space character at the current cursor position |
| DELC | Deletes a character at the current cursor position |
| CPES | Copies the current line into memory |

*Table 1. Franklin editing keys.*

The motherboard of the 2200 is much more crowded than the //e's motherboard (see **Photo 2**). The functions performed by the MMU (memory-management unit) and IOU (input/output unit) in the //e have to be performed by numerous discrete chips in the 2200. This increases the chip count and, consequently, the heat generated by the chips on the motherboard. The Ace 2200 has a built-in fan, however, to circumvent heat problems.

The 2200 handles both D-9 and 16-pin DIP game-controller devices. The D-9 connector is on the back of the machine; the 16-pin DIP connector is next to the fan on the motherboard. The 2200's speaker has a volume-control knob, but I found it rather strange to use: It turns through about 270 degrees, but only the first quarter turn or so affects the volume. More than a quarter turn changes the speaker's pitch more than its volume. [*Editor's note: Franklin claims to have developed a better volume control.*]

Also on the motherboard is a built-in parallel-printer interface. You can use this intelligent interface to dump graphics to Epson, Okidata, C. Itoh, and Star Micronics printers. Since the printer interface replaces slot 1, it eliminates the need for a printer-interface card. Of course, if you want to use a serial printer with your Ace 2200, you will still need a serial-interface card.

## Expansion

The Ace 2200 has less expansion capability than the //e. As noted above, the built-in parallel interface takes up slot 1. This leaves two open expansion slots and an expansion bus in the 2200. One of the available slots is physical slot 2; you can select the

| Key | Definition | Key | Definition |
|---|---|---|---|
| F1 | CATALOG,D1 return | F7 | COPY |
| F2 | CATALOG,D2 return | F8 | TYPE |
| F3 | PR#3 return | F9 | LOCK |
| F4 | PR#1 return | F10 | UNLOCK |
| F5 | Escape 4 | F11 | DELETE |
| F6 | Escape 8 | F12 | RENAME |

*Table 2. Function-key definitions.*

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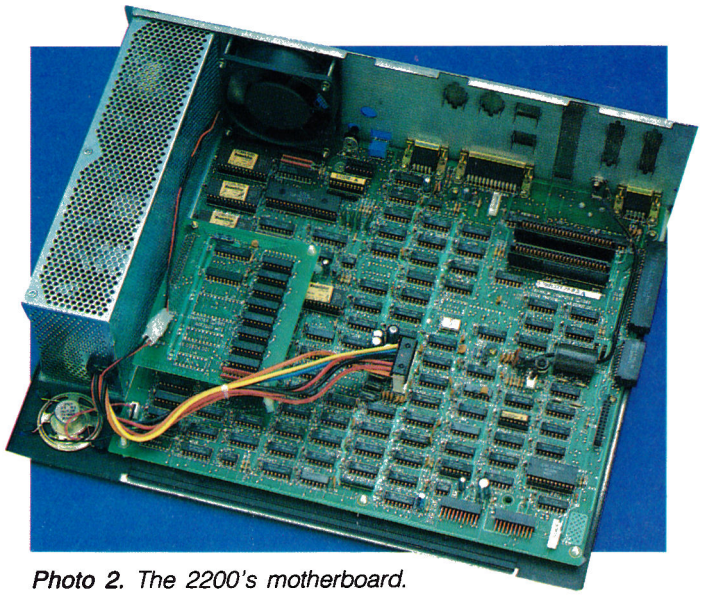

*Photo 2. The 2200's motherboard.*

other to be either slot 4 or slot 7. To increase the number of physical slots available to you, you can hang an expansion chassis from the expansion bus, which you access via a panel in the side of the machine. In default mode, the expansion bus occupies slot 5.

How does this stack up against the //e? The //e has eight slots—seven peripheral slots and the auxiliary slot. Logically, the auxiliary slot and slot 3 are identical (physically, they are very different), so you actually have seven slots in a //e. To perform the built-in functions on the Ace 2200, you would have to use three of the //e's seven slots (slots 1, 3, and 6), leaving four slots for further expansion. An Ace 2200 without an expansion chassis therefore has two fewer slots than a //e, cutting down on its expansion options.

One more thing to note about expansion with the Ace 2200 is that it has no auxiliary slot. Consequently, you can't plug an auxiliary-slot memory board into the 2200. Franklin has recognized this limitation and introduced a 512K memory board that piggybacks on top of the motherboard. At the time of this writing, the board was scheduled for release in December 1985. [*Editor's note: At press time, Franklin offered a 320K expansion board for $139, a 512K board for $199, and an RGB card for $79.*]

## System Software

The Franklin Ace 2200 comes with two types of system software: disk-based and ROM-based. The ROM-based software consists of the basic input/output system of the computer (called the Monitor) and Franklin BASIC, which is functionally identical to Applesoft BASIC. Any program written in Applesoft should work on the Ace 2200.

Franklin supplies its disk-operating system, FDOS 2, with the Ace 2200, along with a number of utility programs. These programs let you copy files and disks, verify disk files, and make diagnostic checks of your system. As I mentioned before, FDOS lets you format disks in either the Apple 35-track format or in 40-track format. Disks initialized with 40 tracks can hold about 15 percent more data than 35-track disks.

## Documentation

The 2200's *User Reference Manual* details the computer's setup and use, but it doesn't provide much technical information about the machine or Franklin BASIC programming. For details, refer to *The Ace 2000 Technical Reference Manual*, and for programming information, Franklin recommends that you use Applesoft books and manuals.

Another type of documentation—call it "real-time documentation"—is provided by indicator lights on the front panel and disk drives. In addition to a power-on indicator, lights indicate the level of CPU activity and tell you when a diagnostic routine is being run, when a disk error occurs, and when double hi-res graphics is in use. Besides the disk-use light, the disk drives have another indicator that tells you specifically when you're writing to a disk.

The Ace 2200 is warranted for 90 days, and Franklin will immediately replace any defective unit. If you don't live near a Franklin dealer, you can send a malfunctioning unit directly to Franklin for service.

## The Key to Success

The most important question about the 2200 is this: Does it run //e software? The answer is a qualified yes. AppleWorks ran perfectly on the 2200, as did Apple Writer 2.0 (the ProDOS version). Apple Writer //e, however, didn't run at all. To my surprise, SuperCalc3a, which doesn't run on unenhanced //e's, worked fine on the 2200.

Other favorites that ran on the Ace included The Print Shop, The Newsroom, Bank Street Writer, the PFS series (Pascal-based versions), Sargon III, and even WordStar and dBase II (with a compatible CP/M card). I also got to play with Gato from Spectrum Holobyte—the first commercial program that takes advantage of the 2200's function keys. As the popularity of the Ace 2000 series grows, more software vendors will incorporate the use of function keys as an option in their Apple products.

Obviously, I was unable to run every program available for the Apple II, so I can't give you a percentage compatibility figure for the Ace 2200. Even if I could, any compatibility figure below 100 percent would be meaningless. You buy a computer that runs the software you want to use. If the Ace 2200 does everything you want a computer to do, you may not need a //e. If you *must* play F-15 Strike Eagle or write with Apple Writer //e, however, stick with an Apple machine.

How do you find out if *your* software runs on the Ace? The best thing you can do is to test your software on a friend's or a dealer's machine. The next-best thing is to check the lists Franklin supplies to its dealers. You may be leery about trusting a manu-

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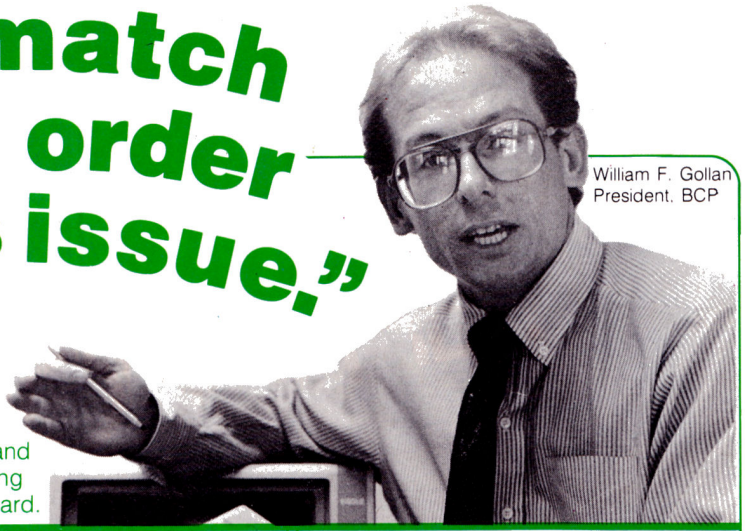

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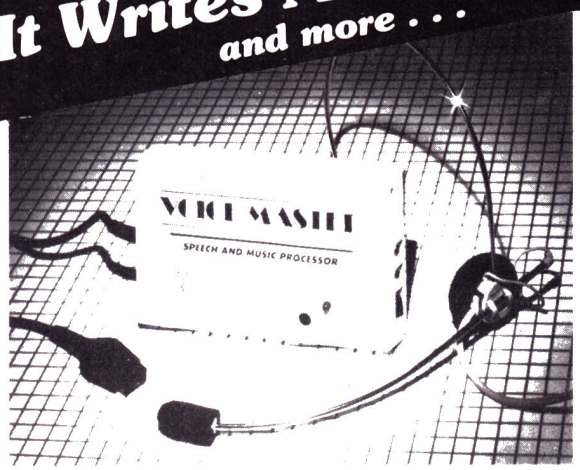


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facturer on this point, but I haven't found any discrepancies between what Franklin says will run and what I've found to run. This doesn't mean that discrepancies won't occur, but Franklin seems bent on ensuring that its list is as accurate as possible.

The same reasoning applies to peripheral boards. If the 2200 can't work with the hardware you need, then save yourself a lot of headaches and buy a //e.

That the Ace 2200 runs most of the current crop of Apple II software is no guarantee the machine will adapt to any new technologies Apple incorporates into the II line. Franklin is committed to keeping pace with the technological development of the Apple II, but that's no assurance of future compatibility—that's the risk that buyers of clone computers face.

| Franklin Ace 2200 | Apple //e |
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Note that although the above systems are comparable, you still get two more slots with the //e than with the Ace 2200.

*Table 3. Price comparison—Franklin Ace 2200 versus Apple //e. Rather than compare list prices (which rarely reflect reality), I obtained quotes from three Apple dealers and one Franklin dealer for comparable systems. As of November 29, 1985, this is what you would have to pay for an Ace 2200 and a //e.*

### Conclusions

The Franklin Ace 2200 is a very good machine that runs most Apple II programs and works with the majority of Apple II peripheral boards. Many of its standard features are optional or unavailable on the //e. Most important, it's cheaper than a comparably equipped //e (see **Table 3**).

Should you buy a Franklin Ace 2200? If you're a computer novice and unsure of what you're going to do with your machine, then buy Apple. If, on the other hand, you know that the software you need will run on the 2200, you may want to save some bucks and buy Franklin.■

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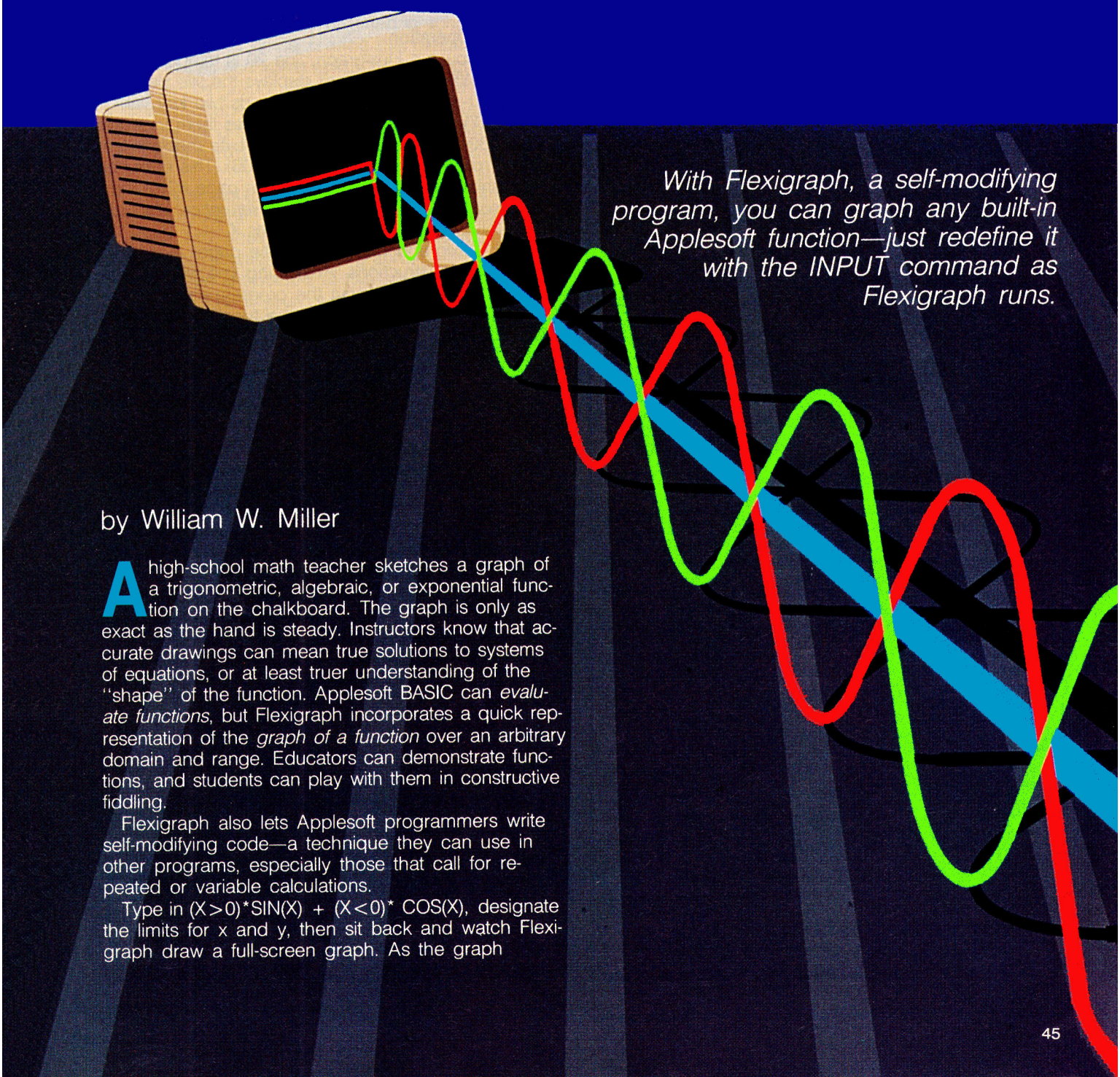

*With Flexigraph, a self-modifying program, you can graph any built-in Applesoft function—just redefine it with the INPUT command as Flexigraph runs.*

by William W. Miller

A high-school math teacher sketches a graph of a trigonometric, algebraic, or exponential function on the chalkboard. The graph is only as exact as the hand is steady. Instructors know that accurate drawings can mean true solutions to systems of equations, or at least truer understanding of the "shape" of the function. Applesoft BASIC can *evaluate functions*, but Flexigraph incorporates a quick representation of the *graph of a function* over an arbitrary domain and range. Educators can demonstrate functions, and students can play with them in constructive fiddling.

Flexigraph also lets Applesoft programmers write self-modifying code—a technique they can use in other programs, especially those that call for repeated or variable calculations.

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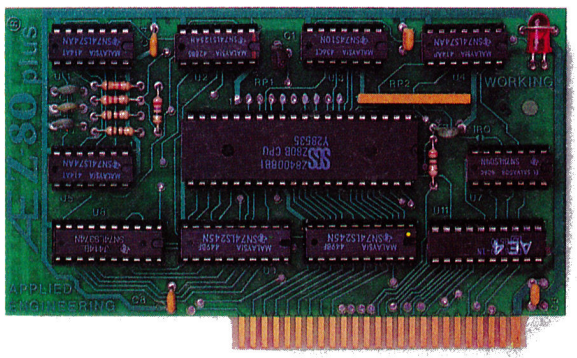

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crosses the vertical axis, it changes from COS(X) to SIN(X). Type SIN(2*X) to superimpose this graph over the first, or erase everything and start anew. You can graph any combination or variation of Applesoft's built-in functions, and you can redefine Flexigraph as it's running.

Flexigraph actually rewrites line 20, which contains the DEF FN (define function) statement, according to your input. It calculates the horizontal and vertical scales, draws the coordinate axes, and plots the hi-res graph—and you can repeat it as often as you like.

The unusual format of line 20, and the unique routines that rewrite it, should especially interest BASIC programmers. You can apply these procedures to other situations in which self-modification would be an efficient technique.

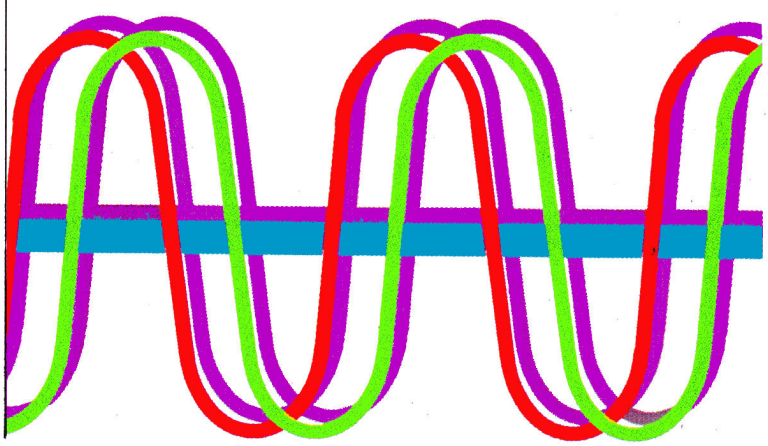
### Program Operation

When you run Flexigraph, line 20 is temporarily bypassed. While the program displays the title page (lines 420–460), your computer reads two key variables, KYWD$( ) and TK( ), and stores them in arrays (lines 480–510). It also installs a 10-byte machine-language routine at address 768 ($0300). This error-handling enhancement is suggested on page 82 of the *Applesoft II BASIC Programming Reference Manual.* The CALL 768 in line 940 executes it.

After Flexigraph displays the title page, it asks you if you need instructions. Answering yes will get you general information about the program (lines 1000–1110), directions for entering the function, and several examples.

The subroutine at line 910 guarantees the integrity of line 20 by POKEing the ASCII code for a colon, 58 ($3A), into each of the 42 memory locations between 2069 and 2110 ($0815–$083E). The colons act as place holders, reserving memory for the actual function definition. An input function overwrites a portion of this memory and replaces some of the colons. The routine also "erases" the function upon completing the graph if the function is rejected, or when quitting the program.

The program inputs the function into DF$ at line 630. The program processes this string in lines 650–790, and POKEs appropriate values into the memory locations reserved by the colons in line 20. (I'll explain this process in much greater detail after an excursion into the Monitor and a discussion of



the way Applesoft stores, or tokenizes, programs in memory.) Line 780 displays the function (simply by listing line 20), and you have the option of accepting or redefining it.

Returning from the subroutine, there's a perfectly legitimate DEF FN at line 20. Applesoft is unaware you've given it a fast shuffle, and the program continues.

You input lower and upper limits for the x and y coordinates in lines 50–100. Lower limits must be negative and upper limits positive—otherwise the program can't graph the axes. An error trap prevents the program from continuing until you've typed in acceptable limits.

Since line 130 uses these limits to calculate the x and y scaling factors for a full-screen display, you have to experiment to avoid distorted graphs. For example, increasing or decreasing the difference between the upper and lower limits for x compresses or elongates the graph along the x-axis. Changes in the y limits produce similar vertical results. Suggested limits for graphs of trigonometric functions are $-6.28$ to 6.28 ($-2\pi$ to $2\pi$) for x and $-2$ to 2 for y.

Line 130 also establishes the plotting increment for the graphing routine. Using the coordinates calculated in line 140, lines 170–180 draw the axes. Lines 210–250 actually plot the graph.

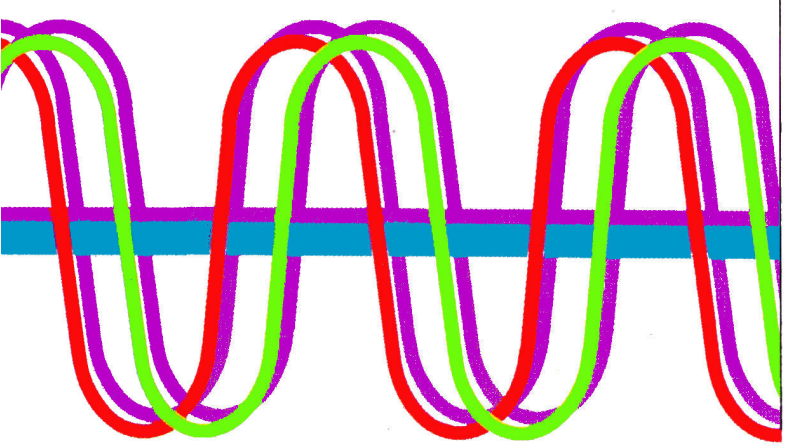
The only error anticipated at this stage is in the syntax of DEF FN. If your computer can't evaluate the function, the program will jump to the error-handling routine (lines 190 and 940). Another listing of line 20 displays the erroneous function, and you can redefine it for another try.

In addition to syntax errors in the function definition, Flexigraph will detect an error if the function is not defined over the subset of the X values you specified. For example, the natural logarithm function is defined only over the set of positive real numbers. But, using an alternate definition, the program can graph this function:

```
DEF FN F(X) = (X>0)*LOG(ABS(X)) or
DEF FN F(X) = NOT(X=<0)*LOG(ABS(X))
```

Note that you can use relational and logical operators (>, =, <, AND, OR, and NOT).

Lines 300–390 provide the option of quitting, graphing another function on the same axes with the same limits and scale, or defining a new func-

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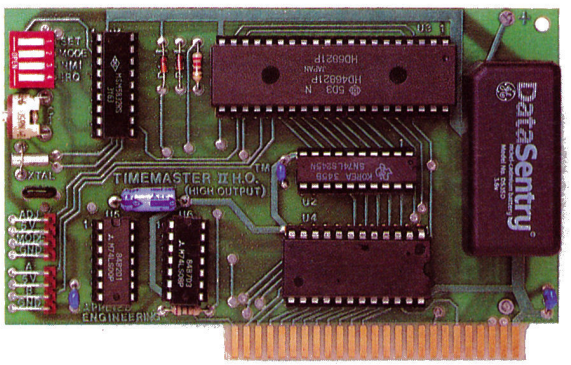


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tion with different limits. A series of prompts protects against accidental erasure.

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Run the program a few times. I think you'll be impressed with the wide range of possible functions and the simplicity of operation. Try these graphs first:

```
2^SIN(X)
SIN(EXP(COS(X)))
(ABS(SIN(X)))^EXP(X) or
((X > -2) AND (X<2))*TAN(SIN(X))
```

Complex graphs such as these are intriguing, and soon you'll be inventing even more exotic functions.

### Self-Modification

To understand how you can change a program line while the program is running, you must understand where and how the Apple II stores BASIC programs. The best way to do this is to write an Applesoft program and examine its code in the Monitor.

If you haven't already typed in Flexigraph (**Listing 1**, p. 52), type NEW and enter it now. At this time, you may prefer to type in just lines 10 and 20 (listed below), as the code for these two lines is of greatest interest in the explanation that follows. Note that line 20 contains 42 colons:

```
10 GOSUB 400
20 DEF FN F(X) = ::::::::::::::::::::::::::::::::::::::::::
```

Your computer stores some of the characters of a BASIC program in RAM as normal hexadecimal ASCII character code. But it stores keywords as 1-byte "tokens," hexadecimal numbers ranging from $80 to $EA. Lines 10 and 20 contain four keywords, listed in **Table 1** with their tokens.

For a complete listing of Applesoft keywords and their decimal tokens, see page 121 (Appendix F) of the *Applesoft II BASIC Programming Reference Manual*, or page 84 (Appendix H.4) of the *Applesoft BASIC Programmer's Reference Manual: Volume 2.*

With at least the first two lines of Flexigraph in memory, enter the Monitor by typing CALL -151. The asterisk Monitor cursor will appear.

Applesoft normally stores BASIC programs starting at 2048 ($0800). The first two lines of Flexigraph occupy 64 ($40) bytes of RAM, from 2048 to 2111 ($0800–$083F).

*Table 1. Keywords in Flexigraph's lines 10 and 20.*

| Keyword | Decimal Token | Hexadecimal Token |
|---|---|---|
| GOSUB | 176 | $B0 |
| DEF | 184 | $B8 |
| FN | 194 | $C2 |
| = | 208 | $D0 |

Type 0800.083F and press the return key for the Monitor listing of these two lines. (Monitor addresses are hexadecimals, but the conventional "$" is omitted in commands and listings.) Your screen display should be identical to **Listing 2** (p. 52).

Address $0800 always contains a zero. Other zeros act as delimiters, separating program lines. Three consecutive zeros mark the end of the program.

The 9 bytes from $0801 to $0809 correspond to line 10 of the BASIC program, illustrated in **Table 2**.

The first 2 bytes of line 10, 0A and 08, designate the memory location of the next line (line 20) using least significant byte/most significant byte (LSB/MSB) notation. Since line 10 ends at $0809, line 20 must start at $080A (for which 0A and 08 are the LSB and MSB, respectively).

The third and fourth bytes, 0A and 00, contain the line number itself, in LSB/MSB form. A zero occurring in the first 4 bytes of a line is part of a 2-byte address or line number—not a delimiter.

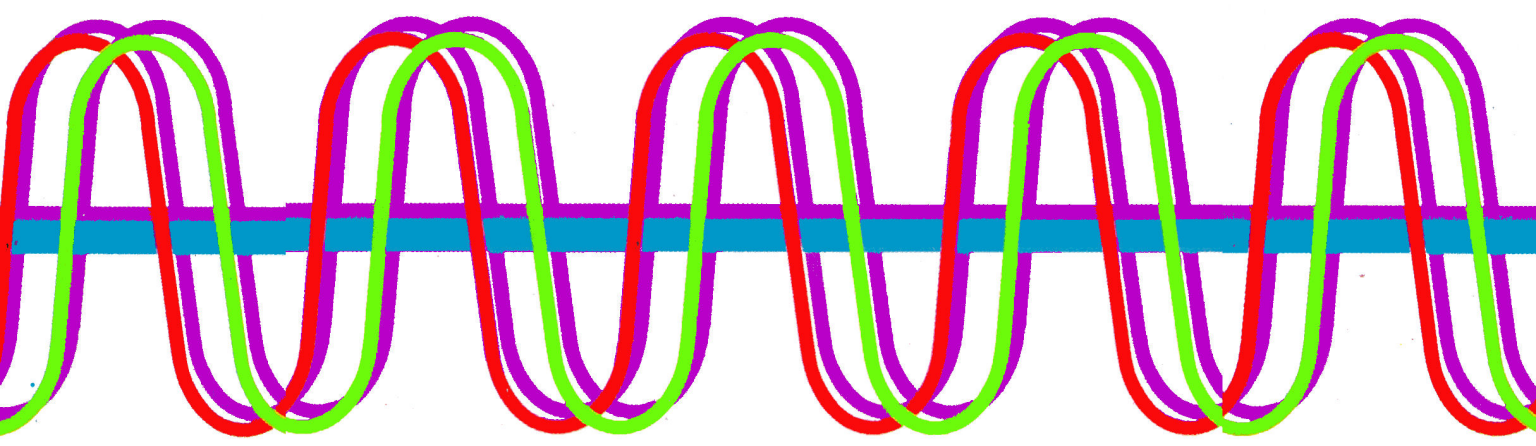
Since keyword tokens range from $80 to $EA, a byte less than $80 represents an ASCII character code, but a byte equal to or greater than $80 is a token for an Applesoft keyword.

The 3 bytes after B0 (the GOSUB token) are the ASCII codes for the characters 4, 0 (zero), and 0 (zero) in the subroutine line number. The line terminates with 00 (double zero) at $0809.

**Table 2** also compares the beginning of line 20 with the first 11 bytes of its code.

The 42 colons are obvious. Each location in the reserved memory area, 2069–2110 ($0815–$083E), contains an ASCII 58 ($3A). Line 20 terminates with 00 (double zero) at $083F.

Don't forget to type control-C or 3D0G to reenter BASIC.



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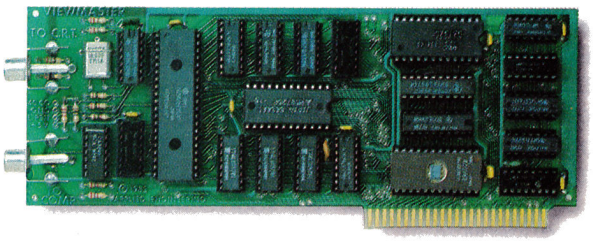

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|---|---|---|---|---|---|---|---|---|---|
| VIEWMASTER 80 | √ | √ | √ | √ | √ | √ | √ | √ | |
| SUPRTERM | | √ | | | | | √ | √ | |
| WIZARD 80 | | | | | √ | | √ | √ | |
| VISION 80 | √ | √ | | | √ | | | | |
| OMNIVISION | | √ | | | | | √ | √ | |
| VIEWMAX 80 | √ | √ | | | √ | | | √ | |
| SMARTERM | √ | √ | | | | √ | √ | | |
| VIDEOTERM | | √ | √ | | √ | √ | | √ | |

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*Table 2. Addresses corresponding to Flexigraph's lines 10 and 20.*

| BASIC | Memory Location(s) | Byte(s) | Remarks |
|---|---|---|---|
| | 0800 | 00 | Beginning location of BASIC (always 00) |
| | 0801–2 | 0A 08 | Location of line 20 |
| 10 | 0803–4 | 0A 00 | Line number 10 (hex) |
| GOSUB | 0805 | B0 | Token for GOSUB |
| 4 | 0806 | 34 | ASCII "4" |
| 0 | 0807 | 30 | ASCII "0" |
| 0 | 0808 | 30 | ASCII "0" |
| | 0809 | 00 | End of line 10 |
| | 080A–B | 40 08 | Location of line 30 |
| 20 | 080C–D | 14 00 | Line number 20 (hex) |
| DEF | 080E | B8 | Token for DEF |
| FN | 080F | C2 | Token for FN |
| F | 0810 | 46 | ASCII "F" |
| ( | 0811 | 28 | ASCII "(" |
| X | 0812 | 58 | ASCII "X" |
| ) | 0813 | 29 | ASCII ")" |
| = | 0814 | D0 | Token for = |

### Input to Tokens

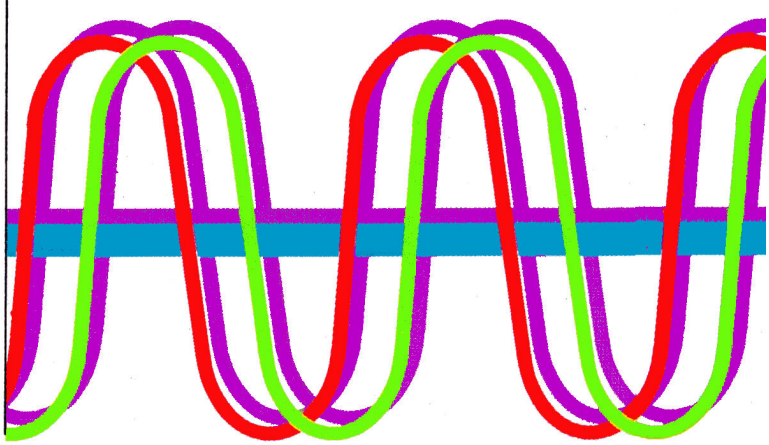
After you input the string defining the function, the subroutine starting at line 650 scans DF$ character by character for keywords. When it finds keywords, it POKEs their tokens into successive locations starting at 2069—each token replacing a $3A (colon) in the process. If it finds no keyword, it POKEs the ASCII code of the current character into memory (line 760).

Lines 700–710 check and process single-character keywords, and lines 740–750 handle three-character keywords. Line 670 specially handles the only pertinent two-character keyword, OR.

Spaces in the input string lead to an execution error, so line 680 discards them. This affects neither the function nor the listing of line 20, since Applesoft arbitrarily inserts or ignores spaces according to its own rules.

The unusual composition of line 20 is a key to the program, of course. It initially contains 42 colons. Used like this, colons are simply delimiters between multiple "empty" statements.

The number of colons isn't critical. I chose 42 simply because it gives a neat listing of line 20. If you anticipate functions with more than 42 characters, you can increase the number of colons up to a



maximum of 239 characters per line. If you do make changes in line 20, be sure to alter subroutine 910 in accordance with the instructions in line 30.

After Flexigraph has scanned and processed each character in DF$, keyword tokens or ASCII codes of the other characters will have replaced some of the original 42 colons in locations 2069–2110. Regardless of the number of colons remaining, they won't interfere with the operation of line 20. The program executes with a properly defined function in accordance with the DEF FN syntax.

### Adapting Flexigraph

I've added several refinements in more advanced versions of Flexigraph. I suggest the following enhancements:

- Plot scale markers on the coordinate axes or overlay the screen with a coordinate grid;
- add a screen dump for your printer;
- incorporate a hi-res character generator to label the graph, origin, and axes;
- change parameters and the plotting routine to accommodate polar functions.

In one variation, you can INPUT x or y limits (or both) as optional multiples or fractions of $\pi$, the axes being scaled and labeled accordingly. This is especially useful for trigonometric and other periodic functions.

Flexigraph will be invaluable to mathematics teachers, students, or anyone interested in the vast array of functions the Apple II family can generate.

I deliberately located the memory area Flexigraph manipulates near the beginning of BASIC storage, 2048 ($0800), for easy identification. But you can apply these techniques to any portion of a program, enabling you to make changes at will. Just locate the memory segment you want to modify and pack it with colons, then insert the desired code with the Flexigraph routines.

Developing the program was an interesting, sometimes frustrating—but always enjoyable—challenge. Flexigraph's concept is simple, and it should be easy to adapt to other situations. ■

*Write to William Miller at R.R. 22, Box 31, Terre Haute, IN 47802.*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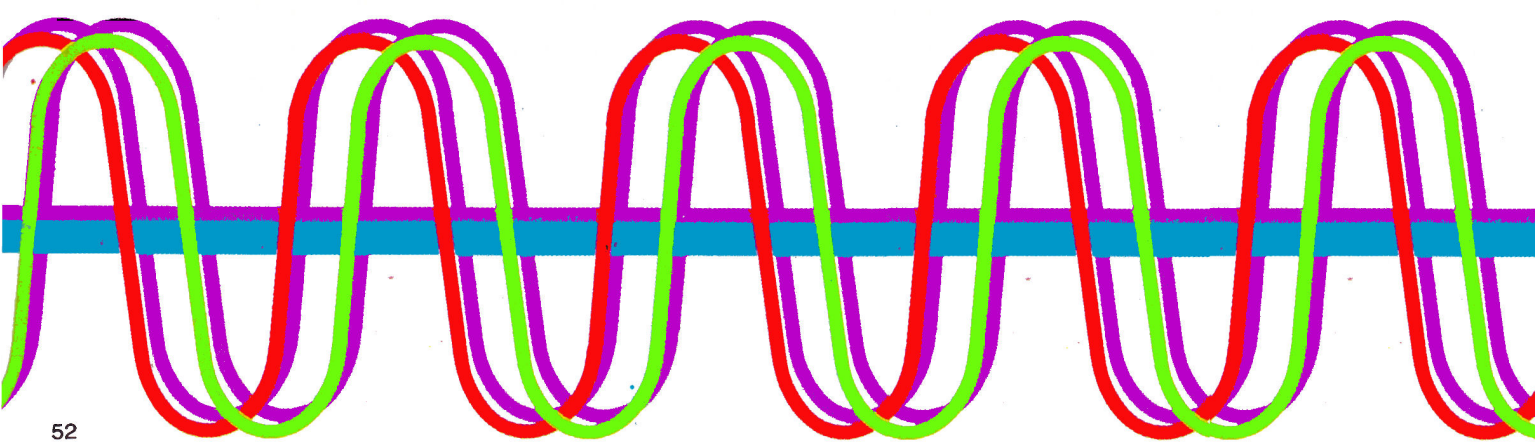
## *Listing 1. Flexigraph.*

```
10  GOSUB 400
20  DEF  FN F(X) = ::::::::::::::::::::::::::::::::::::::::
30  REM : 42 COLONS IN LINE 20: NOTE - IN LINE 910 THE UPPER
     LIMIT OF THE LOOP MUST BE L PLUS ONE LESS THAN THE NUMBE
    R OF COLONS IN LINE 20
40  VTAB 22: HTAB 6: PRINT "LOWER LIMITS MUST BE NEGATIVE": HTAB
     6: PRINT "UPPER LIMITS MUST BE POSITIVE": HTAB 7: PRINT
    "(BOTH X AND Y COORDINATES)";: REM  X/Y LIMIT PROMPT
50  VTAB 10: HTAB 1: CALL 64668: PRINT "X COORDINATE - LOWER
     LIMIT: ";: INPUT "";XL$
60  HTAB 16: CALL 64668: PRINT "UPPER LIMIT:  ";: INPUT "";XH$
70 XL =  VAL (XL$):XH =  VAL (XH$)
80  IF XL =  > 0 OR XH =  < 0 THEN  PRINT BELL$: GOTO 40
90  VTAB 13: HTAB 1: CALL 64668: PRINT "Y COORDINATE - LOWER
     LIMIT: ";: INPUT "";YL$
100  HTAB 16: CALL 64668: PRINT "UPPER LIMIT:  ";: INPUT "";Y
    H$: HOME
110 YL =  VAL (YL$):YH =  VAL (YH$)
120  IF YL =  > 0 OR YH =  < 0 THEN  PRINT BELL$: GOSUB 910: GOTO 90
130 SX = 270 / (XH - XL):SY = 180 / (YH - YL):STP = 1 / SX: REM
    X-Y SCALE AND PLOTTING STEP
140 XC% = SX *  ABS (XL):YC% = 186 - SY *  ABS (YL): REM  X-Y
     COORDS OF ORIGIN
150  HGR : POKE 49234,0: HCOLOR= 3
160  REM : PLOT AXES
170  HPLOT XC%,0 TO XC%,191
180  HPLOT 0,YC% TO 279,YC%
190  ONERR  GOTO 940
200  REM : PLOT GRAPH
210  POKE 49232,0: POKE 49234,0: FOR T = XL TO XH STEP STP
220 X = SX * (T - XL)
230 Y = YC% - SY * ( FN F(T))
240  IF Y =  > 0 AND Y =  < 191 THEN  HPLOT X,Y
250  NEXT T: PRINT BELL$: POKE 49235,0
260  IF  LEN (DF$) > 30 THEN 300
270  VTAB 21: HTAB 20 - .5 * ( LEN (DF$) + 7): INVERSE : PRINT
    " F(X) = "DF$" ";: NORMAL
300 V = 23:H = 1: GOSUB 950: PRINT "ANOTHER GRAPH? (Y/N) ";: GOSUB
     960: PRINT R$;: IF R$ = "Y" OR R$ =  CHR$ (13) THEN  GOTO
     330
310 V = 23:H = 1: GOSUB 950: PRINT "PRESS ";Q$;"Q";Q$;" TO QU
    IT / <RET> TO CONTINUE ";: GOSUB 960: IF R$ = "Q" THEN  HOME
     : TEXT : GOSUB 910: END
320  IF R$ <  >  CHR$ (13) THEN 310
330 V = 23:H = 1: GOSUB 950: PRINT "SAME LIMITS AND SCALE? (Y
    /N) ";: GOSUB 960: IF R$ = "Y" OR R$ =  CHR$ (13) THEN 360

340 V = 24:H = 1: GOSUB 950: PRINT "ERASES SCREEN. ARE YOU SU
    RE? (Y/N) ";: GOSUB 960: IF R$ = "Y" OR R$ =  CHR$ (13) THEN
     HOME : CALL 62450: GOSUB 610: GOTO 40
350  GOTO 330
360  GOSUB 950: PRINT "ERASE PREVIOUS GRAPH(S)? (Y/N) ";: GOSUB
     960: IF R$ = "N" THEN  GOSUB 610: GOTO 210
370 V = 24:H = 1: GOSUB 950: PRINT "PRESS ";Q$;"E";Q$;" TO ER
    ASE / <RET> TO CONTINUE ";: GOSUB 960: IF R$ = "E" THEN
     HOME : CALL 62450: GOSUB 610: GOTO 150
380  IF R$ <  >  CHR$ (13) THEN 370
390  GOSUB 610: GOTO 210
400  TEXT : HOME : REM TITLE PAGE
410 Q$ =  CHR$ (34):BELL$ =  CHR$ (7) +  CHR$ (7):CR$ =  CHR$
    (13)
420 A$ = ": " + "FLEXIGRAPH" + " :": VTAB 6: INVERSE : GOSUB
     900: NORMAL
430 A$ = "WILLIAM W. MILLER": VTAB 9: GOSUB 900
440 A$ = "R.R. 22, BOX 31": VTAB 10: GOSUB 900
450 A$ = "TERRE HAUTE, IN 47802": VTAB 11: GOSUB 900
460 A$ = "COPYRIGHT (C) 1985": VTAB 14: GOSUB 900
470  REM : CREATE KEYWORD AND TOKEN ARRAYS
480  DIM KYWD$(22),TK(22)
490  FOR X = 1 TO 22
500  READ KYWD$(X),TK(X)
510  NEXT X
520  GOSUB 920
530  VTAB 24: HTAB 11: PRINT "INSTRUCTIONS (Y/N)? ";: GOSUB 9
    60: HOME : IF  LEFT$ (R$,1) <  > "N" THEN  GOSUB 1010
600  REM : DEF FN F(X) INPUT ROUTINE
610  GOSUB 910
620  TEXT : HOME : VTAB 23: HTAB 5: PRINT "(PRESS <RET> AFTER
     TYPING THE"
630  HTAB 10: PRINT "FUNCTION DEFINITION)";: VTAB 10: HTAB 1:
     PRINT "DEF FN F(X) = ";: INPUT "";DF$: VTAB 23: HTAB 1:
     CALL 64578: IF DF$ = "" THEN 620
640 L = 2069: REM STARTING ADDRESS OF DEFINED FUNCTION
650  FOR X = 1 TO  LEN (DF$)
660  IF X =  LEN (DF$) THEN 680
670  IF  MID$ (DF$,X,2) = "OR" THEN  POKE L,206:X = X + 1: GOTO
     770
680  IF  MID$ (DF$,X,1) =  CHR$ (32) THEN L = L - 1: GOTO 770
690  REM : CHECK FOR KEYWORDS OF ONE CHARACTER
700  FOR Y = 1 TO 9: IF  MID$ (DF$,X,1) = KYWD$(Y) THEN  POKE
    L,TK(Y):Y = 9:FOUND = 1
710  NEXT Y: IF FOUND = 1 THEN  GOTO 770
720  IF X >  LEN (DF$) - 2 THEN 760
730  REM : CHECK FOR KEYWORDS OF THREE CHARACTERS
740  FOR Y = 10 TO 22: IF  MID$ (DF$,X,3) = KYWD$(Y) THEN  POKE
    L,TK(Y):X = X + 2:FOUND = 1
750  NEXT Y: IF FOUND = 1 THEN 770
760  POKE L, ASC ( MID$ (DF$,X,1))
770 L = L + 1:FOUND = 0: NEXT X
780  VTAB 14: HTAB 1: LIST 20: VTAB 24: HTAB 1: PRINT "IS THI
    S THE FUNCTION (Y/N)? ";: GOSUB 960: IF  LEFT$ (R$,1) =
    "Y" OR R$ =  CHR$ (13) THEN  HOME : RETURN
790  GOTO 610
900  HTAB 20 - .5 *  LEN (A$): PRINT A$: RETURN : REM CENTER-
    PRINT ROUTINE FOR TITLE PAGE
910 L = 2069: FOR X = L TO L + 41: POKE X,58: NEXT X: RETURN
     : REM INSERTS 42 COLONS TO CLEAR FUNCTION IN LINE 20
920  FOR L = 768 TO 777: READ V: POKE L,V: NEXT L: RETURN : REM
    ERROR HANDLING ENHANCEMENT (APPLESOFT II BASIC REFERENCE
     MANUAL, PAGE 82)
930  REM : ERROR MESSAGE
940  TEXT : HOME : PRINT BELL$: CALL 768: VTAB 8: LIST 20: PRINT
     : PRINT "FUNCTION CANNOT BE EVALUATED": PRINT : PRINT "P
    RESS ";Q$;"RETURN";Q$;" AND REENTER FUNCTION ";: GOSUB 9
    60: POKE 216,0: GOSUB 610: GOTO 190

950  VTAB V: HTAB H: CALL 64578: RETURN : REM SETS CURSOR AND
     CLEARS TO BOTTOM OF SCREEN
960  GET R$: POKE 49168,0: RETURN : REM GET AND CLEAR KEYBOAR
    D ROUTINE
1000  REM : INSTRUCTION MODULE
1010  VTAB 6: PRINT Q$;"FLEXIGRAPH";Q$;" DRAWS FULL SCREEN HI
    -RES   GRAPHS OF THE APPLESOFT FUNCTIONS (OR   FUNCTIONS
     DERIVED FROM ONE OR MORE OF   THEM) USING THE ";Q$;"DEF
     FN";Q$" COMMAND.": GOSUB 1110
1020  VTAB 11: HTAB 1: PRINT "AN ORDINARY STRING ";Q$;"INPUT"
    ;Q$;" DURING": PRINT "PROGRAM OPERATION DEFINES THE FUNC
    TION.": GOSUB 1110: HOME
1030  VTAB 6: HTAB 1: PRINT "WHEN THE FOLLOWING PROMPT APPEAR
    S ON THESCREEN - (AFTER THESE INSTRUCTIONS):": PRINT : PRINT
     : HTAB 10: PRINT "DEF FN F(X) = "
1040  PRINT : PRINT : PRINT "TYPE THE FUNCTION AS YOU WISH IT
     TO BE  DEFINED AND PRESS <RET>.": VTAB 23: HTAB 12: PRINT
    "(PRESS ANY KEY)";: VTAB 10: HTAB 24: GOSUB 960
1050  HOME : VTAB 6: PRINT "HERE ARE SOME EXAMPLES OF THE ";Q
    $;"DEF FN";Q$;"  SYNTAX:"
1060  PRINT :F$ = "SIN(X)": GOSUB 1100
1070 F$ = "3*COS(2*X)": GOSUB 1100
1080 F$ = "(X>-2)*EXP(X)": GOSUB 1100
1090  PRINT : PRINT : PRINT "IN EACH EXAMPLE ONLY THE CHARACT
    ERS      SHOWN IN INVERSE WOULD BE TYPED.": GOSUB 1110: HOME
     : RETURN
1100  PRINT : HTAB 5: PRINT "DEF FN F(X) = ";: INVERSE : PRINT
    F$: NORMAL : RETURN
1110  VTAB 23: HTAB 12: PRINT "(PRESS ANY KEY) ";: GOSUB 960:
     RETURN
1200  REM : KEYWORD/TOKEN DATA
1210  DATA +,200,-,201,*,202,/,203,^,204,&,205,>,207,=,208,<,
    209
1220  DATA NOT,198,AND,205,SGN,210,INT,211,ABS,212,SQR,218,RN
    D,219,LOG,220,EXP,221,COS,222,SIN,223,TAN,224,ATN,225
1230  REM : ERROR ROUTINE CODE
1240  DATA 104,168,104,166,223,154,72,152,72,96
```

## *Listing 2. Monitor listing of the first two lines of Flexigraph.*

```
]CALL -151

*0800.083F
0800-  00  0A  08  0A  00  B0  34  30
0808-  30  00  40  08  14  00  B8  C2
0810-  46  28  58  29  D0  3A  3A  3A
0818-  3A  3A  3A  3A  3A  3A  3A  3A
0820-  3A  3A  3A  3A  3A  3A  3A  3A
0828-  3A  3A  3A  3A  3A  3A  3A  3A
0830-  3A  3A  3A  3A  3A  3A  3A  3A
0838-  3A  3A  3A  3A  3A  3A  3A  00
```



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| **768k MULTIRAM** IIe/FREE RGB | **322.** | 292. |
| **1024k MULTIRAM** IIe/FREE RGB | **372.** | N/A |
| 1280k MULTIRAM IIe/FREE RGB | **520.** | N/A |
| 1536k MULTIRAM IIe/FREE RGB | **548.** | N/A |
| 1792k MULTIRAM IIe/FREE RGB | **578.** | N/A |
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# APPLEWORKS IN ACTION

## Customer Mailing Labels with AppleWorks

by Ruth K. Witkin

In this new *inCider* column, we'll explore ways to use the AppleWorks data base, spreadsheet, and word processor to help run your business more productively and profitably. The operative word here is *more*—more applications, more tips, more techniques. It's quite a tall order.

Businesses and the people who run them are as diverse as the logos on their letterheads. The one thing every business has in common with all the others, though, is that it sells a commodity—whether it's the brains of a consultant, the skills of a specialist, or the products of a supplier or manufacturer. Patterns of planning, analyzing, and communicating are similar. So, this column will tread a fine line and offer a variety of broad-based practical applications you can apply directly to your business or adapt for your specific needs.

I'll present the instructions step by step—press this key, type that key, and so on. Following along will make your fingers nimble, but my goal is more ambitious. You'll be learning by doing and understanding *why* you're doing it. You don't even have to know anything about programming or any technical terms. Some start-up and set-up steps are summarized, so you do need a basic familiarity with AppleWorks.

**Learn to use AppleWorks' data base to organize your address lists and print mailing labels.**

This month's tutorial, the first of a three-parter, explains how to build a data base of customers and generate mailing labels. In my next column, you'll be using the AppleWorks spreadsheet and a lookup table to prepare a quotation for one of these customers, and, in the column after that, compose a letter, then "cut and paste" the quoted information from the spreadsheet into the letter. Cut-and-paste lets you turn pieces and parts of files into a seamless whole.

### The Mailing-List Data Base

Let's pretend you own the small, but growing, Rocky Hill Hardware Supply Company, a wholesale distributor. In addition to responding to RFQs (requests for quotation), you mail letters and promotional material to customers and, at Christmas, send cards of appreciation for their business. The mailing labels generated by your customer data base are shown in **Figure 1**.

Labels come in many styles and sizes. I use the fanfold, one-across, pressure-sensitive kind in a standard 3½ inches wide by 15/16 inch high. If you don't have label paper in your printer, you can get an idea of what they'll look like with normal printer paper.

### Data Base Definitions

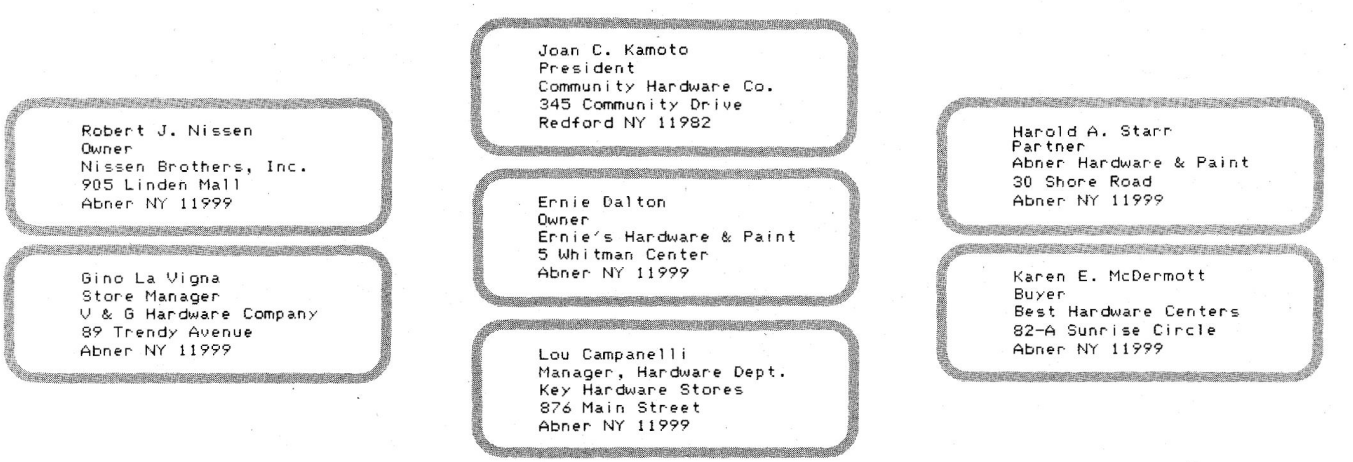
A data base is a collection of information organized into entries, categories, and records. An *entry* is a *single piece of information*, such as the name of a specific company or a zip code. A *category* is *one type of information*, such as the names of all the companies or all the zip codes in the data base. A *record* is *all the information about one company*—contact person, company name, street, city, state, zip code, and so on.

### Keystrokes and Other Matters

When you see such key combinations as OA-Y, hold down the open apple key and type Y. With repeated combinations, such as OA-right arrow (9 times), hold down the open apple key and press the right arrow key nine times. If you make a typo, hit the delete key to back up the cursor and erase the character.

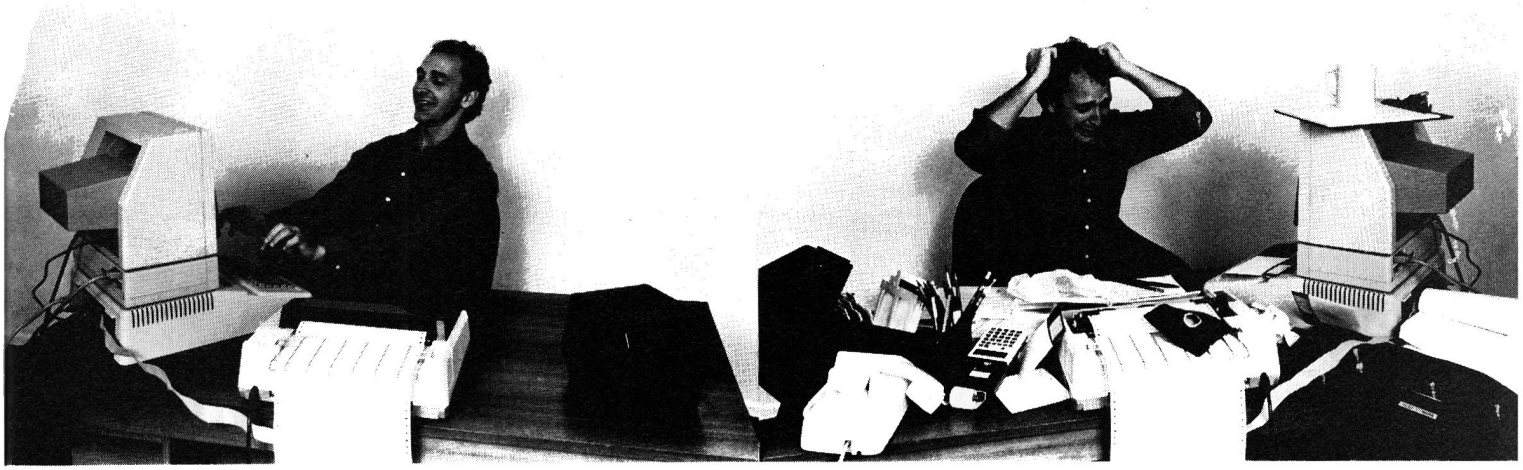
At some stages of the creation process, I'll ask you to save the data

*Figure 1. Mailing labels produced with an AppleWorks customer data base.*



**This man has the *EasyCard...***

**and this man does not. Obviously...**



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All of the EasyCard software systems are resident in the card; so there are no diskettes to load. Future additions to the EasyCard software family will be available on simple to install EPROM's. Unlike the so called "enhancers" the EasyCard does not steal any Apple's memory from your application programs. **The *EasyCard* hardware and software is compatible with all 6502/65C02 application programs. Absolutely no modification is needed for your software.**

★ **SideJob** is to Apple what SideKick is to IBM PC. Modeled after the Borland's top seller of 1985 the SideJob will clean-up your desk in minutes. With a keystroke get into the SideJob window where you can run a Calculator with numerical and logical functions, jot down notes on a Note Pad, glance at the ASCII Table or do decimal-hex-binary conversions. When you are done, single keystroke gets you back to your application program as if nothing happened.

★ **MacroKey** is a perfect solution to repetitive typing of lengthy character strings. Just assign strings of characters to keys of your choice and everytime you press these again while holding EasyCard's secret key the strings will be typed in automatically. To all application programs this will appear as if typed by you. Now that's artificial intelligence working for you!

★ **InstaDOS** is like having DOS 3.3 or ProDOS built directly into your Apple. Now you can store each of these utilities in the EasyCard memory and download them without ever using the diskettes again. What a time saver!

★ **Screen Dump** will give you a hard copy of what is on the screen. Exactly as you see it and any time you want it! Prints text, HI and DOUBLE HI RES graphics or mixed displays at a push of a button. Can even blow-up graphics to twice the size! Compatible with most popular printers and interface cards. Unlike other screen dump software or cards this system works also on protected programs.

★ **Copy Program** is an extensive utility software package. It allows you to make backup copies of all (including protected!) memory resident programs of up to 128k at a push of a button. Copying time is less than 30 seconds. The copy produced is unprotected and subject to study or change. Special software included allows the copy to run without the EasyCard in the Apple. Other functions can be used to single step and trace through any program.

★ **Clock** is of course ProDOS compatible. But now you can also check the time/date while in the middle of any application program. That is something no other clock can do!

**Pricing Information:** *EasyCard* board without any software: $119.99; for each software system add $29.99. Buy packaged sets and save: Starter Set with the board, the Copy Program, Screen Dumps and SideJob: $159.96 (save $50); Advanced Set with all six systems: $219.93 (save $80). Add $5.00 for shipping and handling. Calif. residents please add 6% (L.A. County 6.5%) Calif. Sales Tax. Please specify computer, printer and interface card when ordering.

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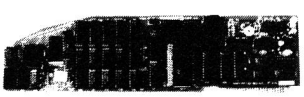

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base. If you have a one-drive system, watch for the screen prompts that tell you when to swap the program disk for the data disk. You'll be working with the insert cursor (the blinking underline) until the instructions say otherwise. Now, let's begin.

### Creating the Data Base from Scratch

Use the AppleWorks Startup and Program disks to bring up a new data-base screen. When AppleWorks asks for a file name, type **MAIL LIST** and press the return key. You should now see the Change Name/Category screen.

**Figure 2** lists the category names. To keep it simple, this data base contains only those categories needed for mailing labels. You can have up to 30 categories, including information such as phone numbers, type of company, sales representative, purchases to date, and so on.

Your cursor is on the C in **Category 1**. The first thing to do is erase these words, so press OA-Y. Now type the following category names and press the return key after each one: **First MI**, **Last**, **Title**, **Company**, **Street**, **City**, **State**, and **Zip**. Keeping the first name, last name, city, state, and zip code in separate categories gives you full flexibility when you want to arrange or sort records.

*Figure 2. Category names from an AppleWorks mailing-list data base.*

```
File: MAIL LIST              CHANGE NAME/CATEGORY    Escape: Review/Add/Change
Category names
================================================================================
First MI                                |
Last                                    | Options:
Title                                   |
Company                                 | Change category name
Street                                  | Up arrow    Go to filename
City                                    | Down arrow  Go to next category
State                                   | @-I         Insert new category
Zip                                     | @-D         Delete this category
                                        |
                                        |
                                        |
                                        |
                                        |
                                        |
--------------------------------------------------------------------------------
Type entry or use @ commands                                        53K Avail.
```

This completes the category entry. Press the escape key, and AppleWorks informs you that you'll automatically go into the Insert New Records mode. Press the space bar or the return key, and Record 1 appears in the single-record layout with all your categories awaiting entries.

**Figure 3** shows the entries in the records. All your customers except Community Hardware (Record 7) are located in the city of Abner, state of New York, zip code 11999. Entries common to most or all of your records are called *standard values*. When you set a standard value, AppleWorks automatically enters the information into each record to save you time.

Press OA-V to bring up the Set Standard Values screen. Press the down arrow key (5 times), type in **Abner**, press Return, type **NY**, press Return, type **11999**, and press Return again. Now hit the escape key to return to Record 1 in the Insert New Records screen.

The next step is to type in the rest of the information in Record 1. First, press the up arrow key (7 times) to move the cursor to the **First MI** category. Type in the following words, and be sure to press the return key after each entry: **Harold A.**, **Starr**, **Owner**, **Abner Hardware & Paint**, and **30 Shore Road**. To skip past the standard entries and bring up Record 2, press OA-down arrow.


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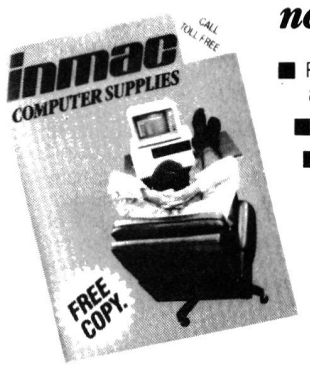


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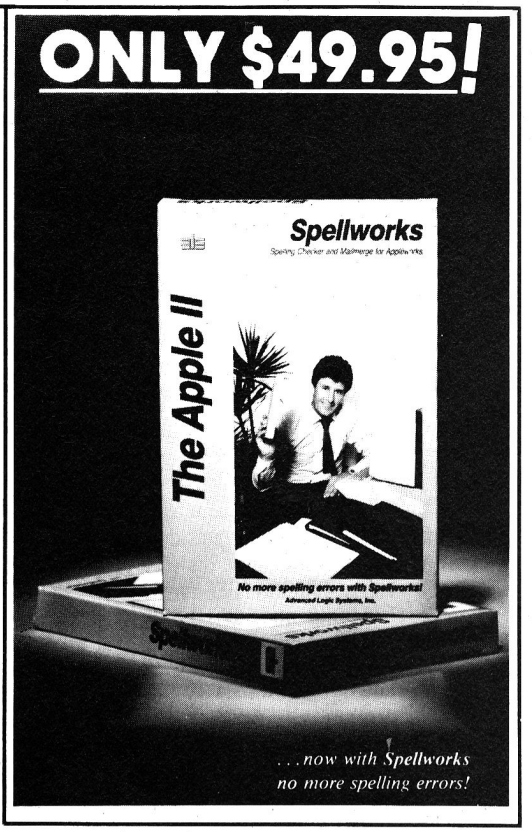


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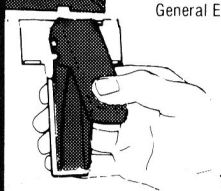

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# APPLEWORKS IN ACTION

*Figure 3. Record entries from an AppleWorks mailing-list data base.*

| CATEGORY | RECORD 1 | RECORD 2 |
|---|---|---|
| First MI: | Harold A. | Lou |
| Last: | Starr | Campanelli |
| Title: | Owner | Manager, Hardware Dept. |
| Company: | Abner Hardware & Paint | Key Hardware Stores |
| Street: | 30 Shore Road | 876 Main Street |
| City: | Abner | Abner |
| State: | NY | NY |
| Zip: | 11999 | 11999 |

| CATEGORY | RECORD 3 | RECORD 4 |
|---|---|---|
| First MI: | Robert J. | Karen E. |
| Last: | Nissen | McDermott |
| Title: | Owner | Buyer |
| Company: | Nissen Brothers, Inc. | Best Hardware Centers |
| Street: | 905 Linden Mall | 82-A Sunrise Circle |
| City: | Abner | Abner |
| State: | NY | NY |
| Zip: | 11999 | 11999 |

| CATEGORY | RECORD 5 | RECORD 6 |
|---|---|---|
| First MI: | Gino | Ernie |
| Last: | La Vigna | Dalton |
| Title: | Store Manager | Owner |
| Company: | V & G Hardware Company | Ernie's Hardware & Paint |
| Street: | 89 Trendy Avenue | 5 Whitman Center |
| City: | Abner | Abner |
| State: | NY | NY |
| Zip: | 11999 | 11999 |

| CATEGORY | RECORD 7 |
|---|---|
| First MI: | Joan C. |
| Last: | Kamoto |
| Title: | President |
| Company: | Community Hardware Co. |
| Street: | 345 Community Drive |
| City: | Redford |
| State: | NY |
| Zip: | 11982 |

*Figure 4. Mailing-list report format from an AppleWorks data base.*

```
File: MAIL LIST                  REPORT FORMAT              Escape: Report Menu
Report: CUSTOMER LABELS
Selection: All records

================================================================================
First MI ‹Last
Title
Company
Street
City ‹State ‹Zip

------------------------Each record will print  6 lines-------------------------




--------------------------------------------------------------------------------
Use options shown on Help Screen                                  ⌘-? for Help
```

Refer to **Figure 3** and follow the same procedure to fill Records 2 through 6 *only*. Be sure to press Return after typing each entry, then OA-down arrow to get to the next record. When you're done, your cursor should be in the **First MI** category in Record 7.

Now type in the information in the first five categories of Record 7, from **First MI** to **Street**. Your cursor should now be in the **City** category.

In the next few steps, you'll switch to the overtype cursor (a blinking rectangle), replace the standard **Abner** entry with **Redford**, and the zip code **11999** with **11982**. To do this, press OA-E, type **Redford**, press Return (2 times), press the right arrow key (3 times), type **82**, and press Return.

Store the data base on disk by pressing the OA-S key combination. AppleWorks saves the file and brings up the records in the multiple-record version of the Review/Add/Change screen. A few of the records are "hiding" under the dashed line. Press OA-1 to bring them into view.

The next step is to create a format to print the mailing labels. Press OA-P to bring up the Report Menu screen. Now tell AppleWorks you want to create a new label format and name the report CUSTOMER LABELS: Type 3, press Return, type CUSTOMER LABELS, and hit the return key again. **Figure 4** shows the mailing-label format.

### Positioning the Categories

Keeping categories separate is a plus when you arrange records. On a mailing label, though, the first and last names belong together on one line, as do the city, state, and zip code.

Let's start by combining the first- and last-name categories. First, press the down arrow key to move the cursor to the **Last** category. Now, move the **Last** category to the right of the **First MI** category: Press OA-right arrow (9 times), then press OA-up arrow.

Left-justifying the last-name category prevents gaps between the first and last names or truncated first names. Your cursor is on the L in **Last**, so press OA-J.

A less-than sign appears, indicating that any entry in the **Last** category will be printed starting at the proper place after the entry in the **First MI** category, regardless of the length of the **First MI** entry. For example, *Campanelli* will begin five characters after the L in *Lou*, and *Nissen* will begin 11 characters after the R in *Robert J.*


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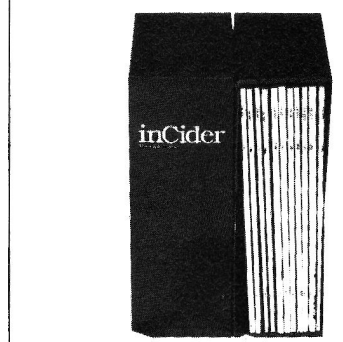


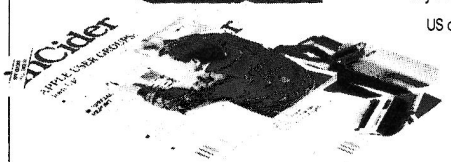


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Now move the cursor to the blank line and delete it by pressing Return, then OA-D.

The city, state, and zip code are combined in the same way. The next few steps move the cursor to the **State** category, position the categories, left-justify the state and zip code so that they're printed properly after the name of the city, and delete a blank line. Press the down arrow key (4 times), OA-right arrow (5 times), OA-up arrow, OA-J, Return, OA-D, OA-right arrow (12 times), OA-up arrow, and OA-J.

The screen should now display the sentence: **Each record will print 6 lines.** The blank line below **City <State <Zip** separates the printing on one label from that on the next.

### Preparing for Printing

Suppose you have a large number of customers. It's easiest to scan a long list arranged by company name. To move your cursor to the C in **Company** and arrange the records in alphabetical order, press up arrow (2 times), left arrow (12 times), OA-A, and then Return.

You don't need a report header at the top of each page of labels, so the next step is to press OA-O to bring up the Printer Options screen. Now toggle the header setting from **Yes** to **No** by typing PH and hitting the return key.

The left-margin setting controls where the information is placed horizontally on the label. With the left sprocket on my ImageWriter as far left as it could go and the right sprocket shifted toward the center, a .4-inch left margin produced a well-balanced look. You're still in the Printer Options screen, so type **LM**, press Return, type **.4**, and press Return again.

The next setting tells AppleWorks the paper length. Think of each label as a complete page and all the labels as a whole collection of pages. The paper length, therefore, is one inch (15/16 inch high plus 1/16 inch between labels). To make this setting, type **PL**, press the return key, type **1**, and hit Return. Now press the escape key to return to the Report Format screen.

You're now set to print the labels. If you have label paper, this is the time to load it. Turn on your printer and follow these steps to start the Print command, select the printer, and confirm one copy: Press OA-P, press Return (or type a printer number, then press Return). Press Return once more and your printer starts working on the customer mailing labels.

Now store the data base and the report format on disk by pressing OA-S. AppleWorks returns to the multiple-record layout in the Review/Add/Change screen. Arranging has a universal effect, so the records on screen are now in alphabetical order by company name, just as they are on the labels. ■

*Ruth K. Witkin is a consultant in computer applications for business. She is the author of* Managing Your Business With Multiplan *(Microsoft Press),* Managing With AppleWorks *(Howard W. Sams & Co.), and* Personal Money Management With Multiplan *(Hayden Books). Ruth is currently at work on an AppleWorks personal money management book to be published by Hayden Books. Write to her at 5 Patricia Street, Plainview, NY 11803.*

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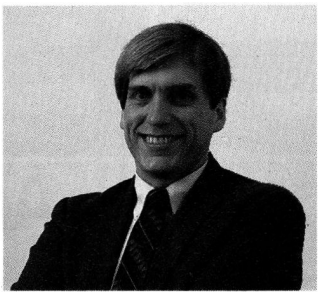

## Intelligence

*"Can you reduce the world to size 128K and still fit reality?"*

by Paul Statt, *inCider* staff

Artificial intelligence is no longer the stuff of science fiction. "Star Wars" may need more brains than either you or I have, but software you can buy for the Apple II today makes it at least as intelligent as the biggest computer of World War II. The Japanese have AI, the Defense Department wants it—it's something you need to know about.

We see intelligence in computers today in the form of expert systems. An expert system is a large data base, called a *knowledge base*, coupled with an *inference engine*. The inference engine is a program that makes logical sense of the information in the data base.

Someone called a *domain expert*, who knows all about a particular subject through experience and training, works with a *knowledge engineer*, who fits that expertise into a form the inference engine can read.

Knowledge engineering reduces complex judgments to simple calculations. We thought of that when we read Jim McKelvey's review of **MicroExpert** (p. 74). On the whole he didn't find MicroExpert complex enough to mirror the world without distortion. MicroExpert isn't a good skeleton for writing expert systems—it supports only one kind of decision structure, the *if. . .then conditional*, which constrains you to certain sorts of questions in your expert system.

"The distinction between an [if-then] *inference engine*, which performs list-processing, and a simple, hard-coded *Pascal* 'if. . .then' construct seems lost on Mr. McKelvey," counters Steve Guty, Senior Editor for Computer Projects at McGraw-Hill. "Aside from the flexibility of having to change only the rule file rather than a program, you see the chain of logic and examine future outcomes."

Steve says an expert-system generator flexible enough to intrigue all kinds of people and transparent enough to convince a skeptical domain expert can't be complex enough for Jim's idea of a real-world application. To make MicroExpert transparent and flexible, Steve is willing to "reduce" the expert system a little more than Jim, who is a Pascal programmer, wants to simplify it.

Jim suggests, "You'd certainly learn more by reading a good magazine article on AI—or even by watching reruns of *Star Trek*." Jim's being facetious, but we do recommend ***The Hitch-Hiker's Guide to Artificial Intelligence*** ($17.95, Methuen, New York), by Richard Forsyth and Chris Taylor. The authors will introduce you to expert systems, natural-language processing, computer vision, machine learning, knowledge representation, problem-solving methods, and computer game-playing strategies.

Each topic includes a manageable (if not short) program in Applesoft BASIC. You could certainly learn more about a range of artificial-intelligence processes from the book than you can from a single expert-system generator. And AI is accessible to you if you have a 64K Apple II and BASIC—you don't need LISP or PROLOG or a supercomputer.

The paradox of knowledge-based expert systems—can you reduce the world to size 128K and still fit reality?—is not limited to artificial intelligence. You may recall similar difficulties in high school when you tried to squeeze all the numbers from a "word problem" into an equation.

Spinnaker Software sells a package called **Homework Helper: Math Word Problems**, which talks you through those deadly traps of Algebra I. It's an expert system of sorts. Randy Davis, of MIT's Artificial Intelligence Lab, calls an expert system "the closest we can get to cloning," and Homework Helper is the best clone of an endlessly patient teacher we've yet seen. It asks questions, it's flexible enough to handle word problems—motion, coins, mixtures, and so on—and it's transparent enough to report to the student all the steps that went into the solution.

The Defense Advanced Research Projects Agency spends more money studying artificial intelligence than does any private interest in the United States. Why?

Battle management, autonomous vehicles, expert co-pilots, and more. Expert systems may be applicable to a ballistic-missile defense system, according to DARPA. The computer watches incoming missiles—no mere mortal could keep track of them. In the December 1985 *Scientific American*, Herbert Lin comments on the Star Wars expert system: "No one has expert knowledge of massive nuclear-missile attacks based on experience." Not only is there no domain expert, the knowledge engineer who writes the Star Wars software is going to have a hard time debugging it—the first run may be the last.■

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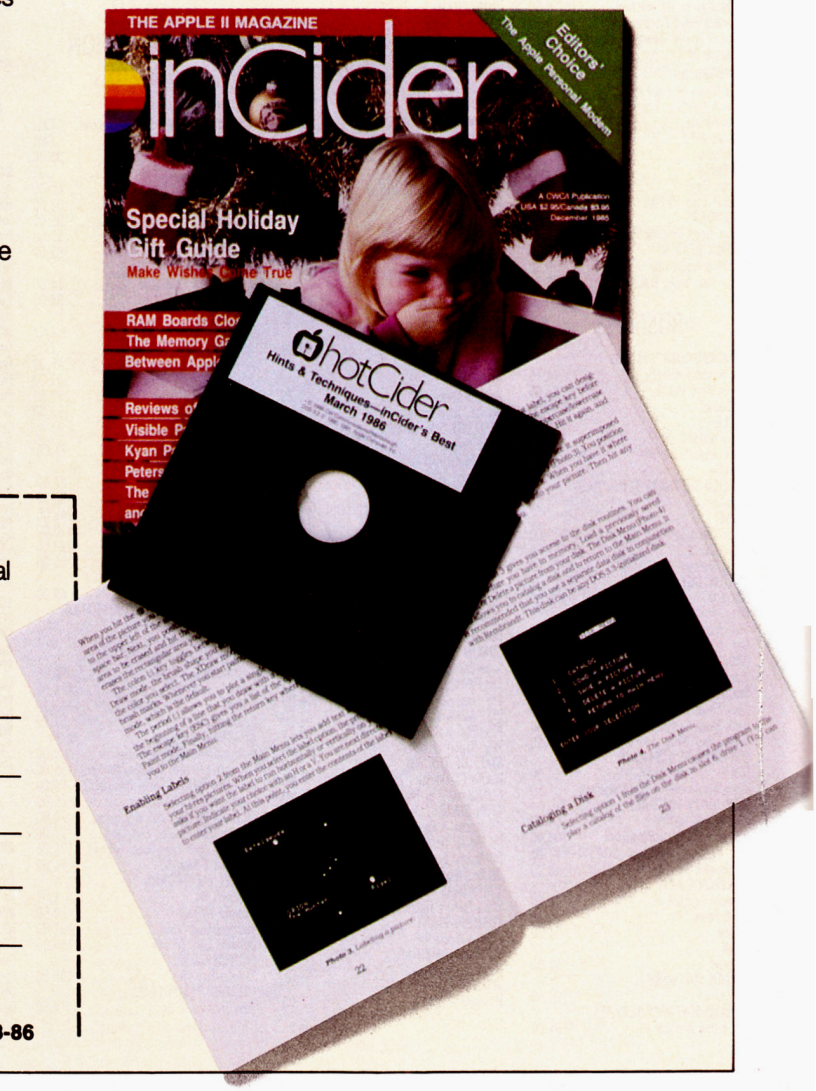


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## inCider's Ratings

| | |
|---|---|
| ★★★★ | Excellent |
| ★★★ | Above average |
| ★★ | Good enough |
| ★ | Not up to standards |
| ☆ | The empty set |

# WordPerfect

*Satellite Software*
288 West Center Street
Orem, UT 84057

Word processor
Apple //c or //e with 128K, one disk drive, two drives, or hard disk recommended
$179.95

| | |
|---|---|
| Ease of setup | ★★★ |
| Ease of use | ★★★ |
| Documentation | ★★ |
| Support | ★★★★ |
| Overall | ★★★★ |

WordPerfect is one Apple program that rivals any of the IBM "big-leaguers." Although this heavy-duty word processor may not be ideal for everyone, serious writers will want to take a look.

Most of the features found in the IBM version of WordPerfect are included in this Apple edition, at well under half the price. There are only four differences worth noting: The Apple version lacks multiple-column editing, multiple-file editing, automatic index, and table-of-contents production.

*WordPerfect supports a wide variety of printers.*

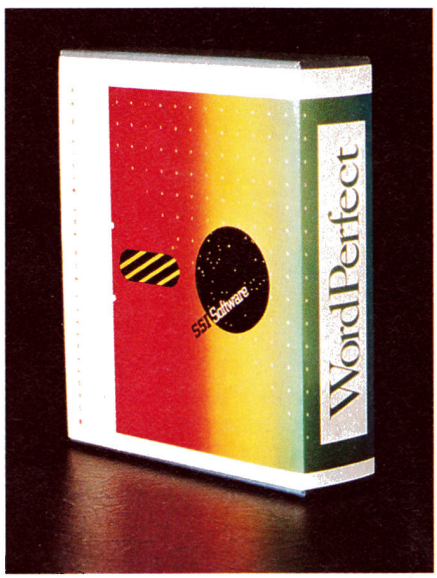
### Filing and Printing: WordPerfect Flexibility

WordPerfect uses a virtual file system, so the size of the text is limited by the capacity of the disk, not the available RAM. If you exceed your disk space, though, you can link files.

WordPerfect puts the power of ProDOS to work—you can use all types of file storage, including hard disks (for speed) and RAM disks. Using a RAM disk is equivalent to having the entire file in RAM, so if you have one of those gigantic multi-megabyte RAM cards, you have enormous potential. The file-retrieval system includes a look-and-back feature that quickly flips through the contents of ProDOS directories or peeks at the first few lines of text in a file. You can load or save blocks or whole files, or append them to existing files.

WordPerfect directly supports most popular printers, but if a prewritten driver for your printer isn't included, you can configure a general driver. Practically everything a printer can do can be easily elicited in WordPerfect. You can insert printer control characters anywhere in your document. (One caveat: If your printer card is not among those listed, WordPerfect will self-destruct shortly after printing a document. Although almost every brand I've ever heard of is included, and a configuration program and telephone assistance are available, be prepared to buy another printer interface if you happen to try some off-beat generic card without sufficient documentation.)

Most word processors have left-right centering. WordPerfect also includes centering over a designated position (useful for column headings) and top-bottom centering. In conjunction with certain printers, WordPerfect can change line spacing (lines per inch) and adjust the number of lines per page accordingly.




*WordPerfect offers an outstanding selection of easy-to-use word-processing features.*

There are no surprises at printout, since WordPerfect prints the display, including the page breaks, as you see it.

### Easy Editing

WordPerfect can line up multiple columns on any character you choose (such as a decimal point). It numbers footnotes automatically and formats them at the bottom of the appropriate pages.

The escape key serves as a multiple-operation key for cursor control, editing commands, and macros. Global operations include control codes, formatting codes, and wild cards.

You can perform case conversion by whole blocks. Soft or hard hyphenation, a "hard space" option, automatic or manual date and time setting, and a cancel command that negates the most recently performed action are also available in WordPerfect.

One of WordPerfect's most powerful features is its macro capability. You can place macros or execute them anywhere, and you can include any

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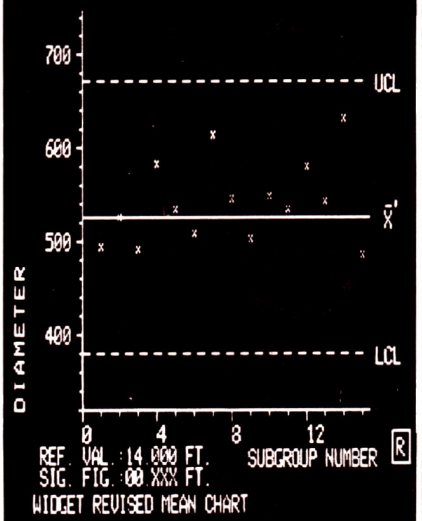


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controls or characters that can be invoked in WordPerfect, including carriage returns, recursion, and links to other macros. Since a macro with a search command can specify conditional links, WordPerfect is really a programmable word processor. You can execute one macro automatically by booting, so you can reset parameters, download a font to your printer, load a work file, and so on, just by turning on your computer.

### The Power of WordPerfect

If you're considering a word processor, the information you need most—and the information most difficult to obtain—is a list of what the program does not do. For WordPerfect, that list is very short. Except for the multiple-column editing, multiple-file editing, and math capabilities of its IBM counterpart, there is little to ask for. Mouse lovers will be disappointed, but this program has convinced me that a mouse is unnecessary, perhaps even ultimately inhibitive.

The documentation is excellent, as far as it goes. The 330-page ring binder is logically organized and indexed. The reference section devotes at least a page to every command family, to provide a thorough explanation of how each command is invoked and how it functions. I spotted one error: The actual block-move or -copy procedure does not quite correspond to the description in the documentation. Also, more information on handling obscure printer- and interface-configuration procedures would be helpful. The tutorial section is comprehensive, and accessible to a computer novice.

WordPerfect is easy to use, despite its power. Most commands consist of pressing the open-apple or closed-apple key with a numeric key, to produce a short menu, followed by a selection number. A help screen and a template that fits over the top row of the keyboard list all the initial command sequences. You have both the speed of commands and the ease of menus. Dastardly mistakes, like accidentally deleting a page or erasing a file, are difficult, since WordPerfect's commands ask for confirmation.

Speed is WordPerfect's biggest drawback with ordinary Apple floppy-disk drives. It's rather slow on anything larger than three or four pages. Block operations on a large file can take a fairly long time. Even ordinary editing occasionally involves waiting for the disk drive.

With higher-speed memory storage—a RAM disk or a hard disk—speed is no problem. (WordPerfect's program disks are not copy-protected, to facilitate hard-disk installation and backup.) The new UniDisk 3.5, which is faster than a 5¼-inch drive and has a much larger capacity, may well be the ideal solution for many WordPerfect users.

Customer assistance is available by phone during Utah business hours, and by modem at night. In the course of evaluating WordPerfect, I wrote to SSI twice and received helpful, immediate responses from competent representatives. A 50,000-word spelling checker is available directly from SSI for $30—a real bargain. You can also update the program with future releases for $25. It's clear that SSI Software is committed to supporting its customers.

It's remarkable how much Apple WordPerfect manages to do within its hardware limitations. Until a faster chip, the 3½-inch drive, and 256K become the new "standard" configuration for Apple IIs, we probably won't do better than this program. Considering the reasonable price of the product, I'd urge any writer who's felt hampered by an inefficient word processor to consider this one.■

*Dan G. McCartney*
*Roslyn, PA*

## Touch Window

*Personal Touch Corporation*
4320-290 Stevens Creek Boulevard
San Jose, CA 95129

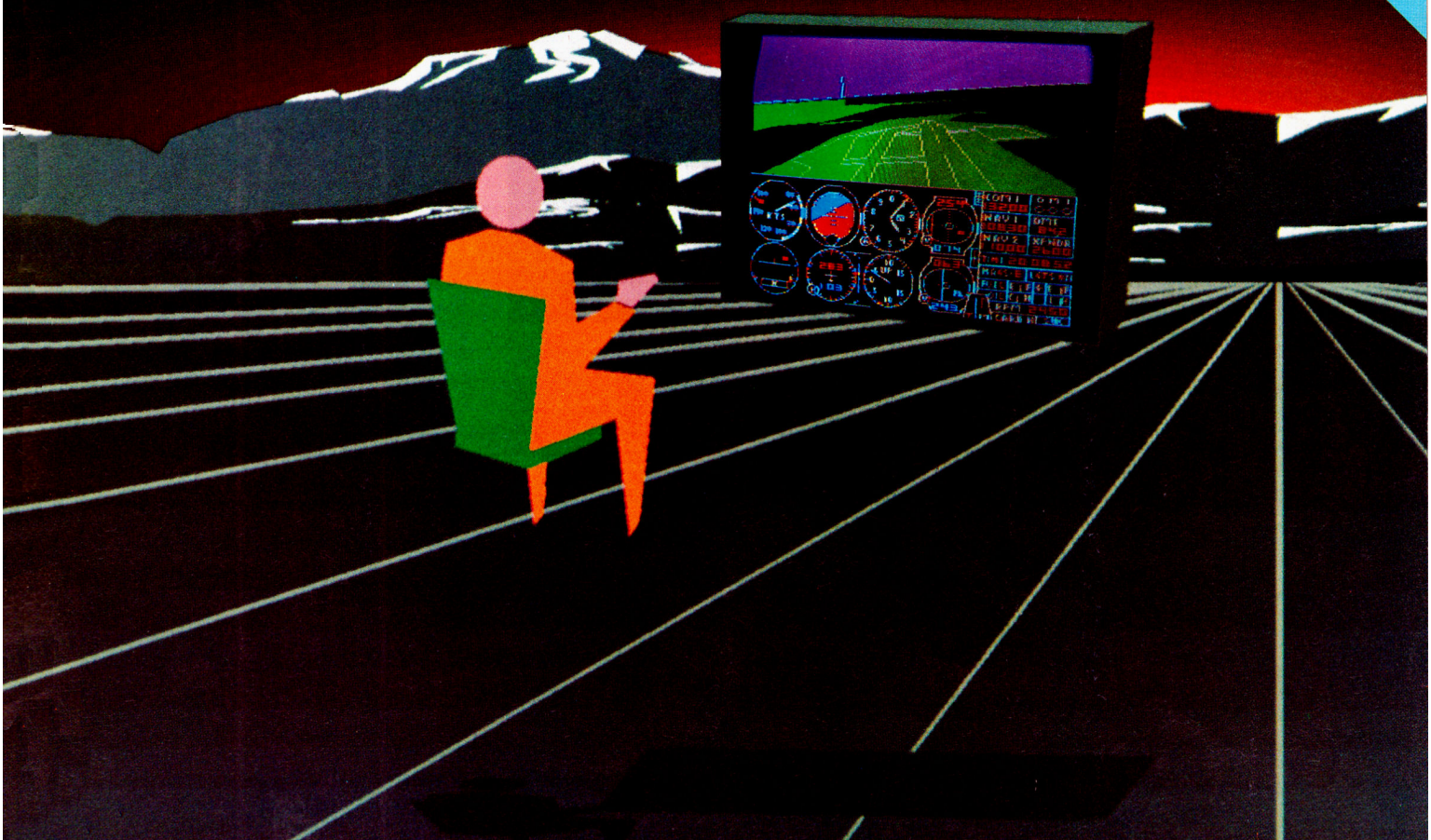
Touch-screen monitor add-on
$199.95 Apple //e, //c
$208.95 Apple II, II Plus
(includes adapter cable)

| | |
|---|---|
| Ease of setup | ★★★★ |
| Ease of use | ★★★ |
| Documentation | ★★ |
| Support | ★★★★ |
| Overall | ★★★ |

Touch Window is a remarkable product in search of software. Velcro® strips mount this transparent touch-sensitive tablet onto an ordinary monitor, converting the Apple II and monitor to a touch-screen system. The software included with the package lacks the hardware's quality, so you probably wouldn't buy the tablet just for the software. Instead, it's useful as demonstration software, best suited to introduce you to the tablet's capabilities. (Check this month's Product Up-

# Flight Simulator II

For Apple II+, Apple IIe, & Apple IIc



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dates, p. 85, for the latest software for Touch Window.)

Measuring 8½ by 11 inches, this well-crafted product fits on any 10- to 15-inch diagonal monitor or TV. Its pressure-sensitive surface responds to either the touch of your finger or the stylus provided. The tablet plugs into the Apple's game port, and its two buttons correspond to the joystick's fire buttons or the open- and closed-apple keys.

Touch Window employs several modes. With appropriate software, you can use it as an input device for all kinds of data entry—a menu pad or an Interactive Book pad, for instance. Most people, however, will use it as a graphics pad. Again, with the right software you can sketch colorful pictures and designs. Though the vendor suggested removing the tablet from the monitor for drawing, I preferred to leave it on.

You'd think that tracing printed items onto the screen would be easy with a transparent touch screen. Not so. There isn't enough resolution to do it satisfactorily. It's like using a fat crayon to trace a detailed drawing—the result is hardly recognizable.

*A child practicing letter formation on Touch Window, using Touch 'N' Write by Sunburst.*

You can also use Touch Window with interactive children's games and educational products. An "Interactive Book" that comes with the tablet contains eight screen overlays. The company will no doubt publish others, and you can develop your own as well.

The tablet serves fairly well for some programs requiring a joystick or paddle, but not for others. Joysticks operate in either a "position" or a "rate" mode; Touch Window works with programs using the former, though it doesn't offer any significant advantages.

### The Software

Touch Window's software comes on a "flippy" disk. One side contains TouchWriter I, a word-processing program; TouchGraphics I, a drawing program; Expense Account Manager, a program that tracks employee expenses by letting you use the touch screen to scroll through a spread-


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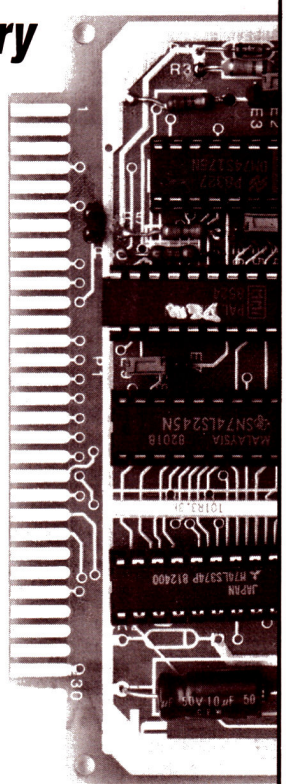

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Advanced Logic Systems, Inc. 1195 E. Arques Ave., Sunnyvale, CA 94086. (408) 730-0307

sheet or identify cells; a checker game; and The Bishop's Square, a game that moves tiles into sequence. On the flip side is the Interactive Book software.

Most of the programs on the main disk are not especially notable. The most useful and interesting is the TouchGraphics I software, which is so similar to Koala Technologies' Micro Illustrator that comparisons are unavoidable. Each lets you draw freehand or straight lines, create boxes and circles, and fill sections of the screen with a variety of colors. But the Koala product gives you several additional functions, including more pen sizes, magnification, and creation of points, rays, solid boxes, and solid circles. The latter two items are possible with TouchGraphics, though they take two steps each.

Micro Illustrator *will* work on Touch Window; in fact, I not only preferred Micro Illustrator to TouchGraphics, but I liked it better on Touch Window than on KoalaPad! With Micro Illustrator, you can draw directly on the screen, and the screen's larger drawing surface helps you draw more freely; drawing on the pad is somewhat artificial—you must use the cursor's position on the monitor as a guide.

The Interactive Book programs are an eclectic lot, featuring something for preschoolers through adults. The most interesting for a group of preteen testers was a map-reading game—appealing because it uses a real map to help you calculate the mileage for a planned trip.

### Complaints

Sold separately (and not evaluated) is the $49.95 Touch Window Tool Kit, which you can use with your own applications. Although more advanced users can program with the kit's modular assembly-language subroutines, less experienced programmers must rely on the Applesoft PDL function. This could have been one of the kit's most appealing aspects, but the package provides no instructions or examples of using this function.

Touch Window supports only Apple Parallel and Super Serial cards, and four printers—ImageWriter, Scribe, Epson FX-80, and Okidata 92—a significant weak point. Printing didn't work with my Okidata 92 printer/Grappler + printer/interface-card combination (a common configuration), even though each applications program let me specify my printer type. (None asked about interface cards.) The word-processing program randomly placed blank spaces between characters, and attempts to print graphics with this software hung the system.

### Potential Users

Touch Window might be useful for handicapped users, though it doesn't eliminate all keyboard entry. Compatible products include The Print Shop, The Newsroom, Blazing Paddles, Dazzle Draw, Graphics Magician, Complete Graphics System, Magic Paintbrush, The Factory, and all Koala products, including the Koala Programmer's Tool Kit. If you plan to use one of these packages extensively,


## System Features:

- 24 Line by 80 Character LCD Display
- 8 Hour rechargeable power supply
- 21 lb. total system weight including //c
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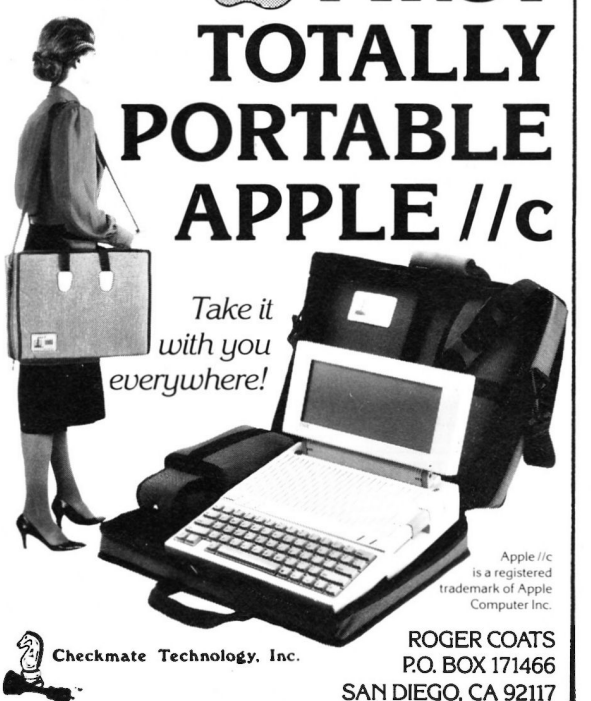


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you should consider Touch Window.

Also, if you feel constrained by the KoalaPad's size, Touch Window may be better for you. Touch Window offers some notable advantages over KoalaPad, though its $200 price compared to the $125 KoalaPad may hurt sales. The price approaches those of products capable of tracing and drawing at a higher resolution.

If you can afford to pay a little more, though, Touch Window is almost luxuriously larger and far more flexible than the KoalaPad, and it offers the advantage of letting you draw right on the screen. The software isn't much, but most users would purchase Touch Window with other software in mind anyway.■

***Daniel W. Umberger***
***Reynoldsburg, OH***

*Editor's note: Personal Touch says it does not intend the software bundled with Touch Window to be state-of-the-art—it's demonstration software at best.*

## MouseWrite

*Roger Wagner Publishing*
10761 Woodside Avenue, Suite E
Santee, CA 92071

Word processor
Any 128K Apple II,
mouse recommended
$125

| | |
|---|---|
| Ease of setup | ★★★ |
| Ease of use | ★★ |
| Documentation | ★★ |
| Support | ★★★★ |
| Overall | ★★ |

MouseWrite makes you wonder if a mouse really adds any convenience to a word-processing program. Nothing is more distracting for a touch typist than having to remove a hand from the keyboard to grab a mouse. It breaks your rhythm and slows down your work.

Suppose you want to use the mouse to delete a word. You move the text pointer to the beginning of the word and click the mouse. Then you move the pointer to the menu line at the top of the screen, find the Edit selection, and click the mouse again to pull the Edit menu down. Now, move the indicator to the Delet Next Word command in the submenu and click the mouse again. The word finally disappears.

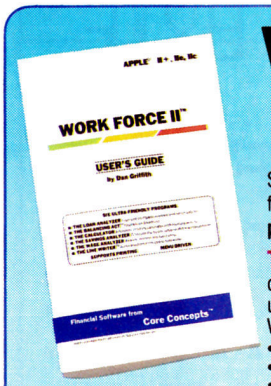
To delete a word with MouseWrite's keyboard commands, you use the arrow keys to move the cursor to the end of the word and hold down the delete key. You can also place the cursor at the beginning of the word and hit the control-D key combination to make the word vanish. Isn't that much easier than using the mouse?

Another problem with mouse-dragged menus is that the proliferation of menu choices can be a little confusing for a first-time user. It takes a while to get used to the system. Since the menu functions can be duplicated by keyboard commands, the long process of using the mouse seems cumbersome when pressing two keys simultaneously does the same job.

There's nothing MouseWrite does with a mouse that it can't do with keyboard commands. In fact, the mouse is only a recommended piece of equipment. Once you've memorized the basic set of keyboard commands, you can work quite rapidly without recourse to the mouse.

Obviously, the purpose of the mouse is to make memorization of commands unnecessary. But you can make the mouse itself unnecessary by creating a "cheat sheet" of the commands you use often, and keeping it in that half-foot square of your desktop where you'd otherwise be pushing your mouse. After you've used the system for a while, you won't even need the cheat sheet.

The mouse aspect aside, MouseWrite is an adequate word processor with more features than you'd expect for $125. It has all the text-handling, printing, and formatting functions you need for professional or educational applications. Revisions, reorganization, and rewrites are easy. And since you use keyboard (or mouse) commands rather than embedded codes to arrange your document (tab setting, paragraph indentation, and centering, for example), text entry is smooth and rapid. MouseWrite also anticipates the idiosyncracies of many different types of printers—the program is especially versatile in this respect.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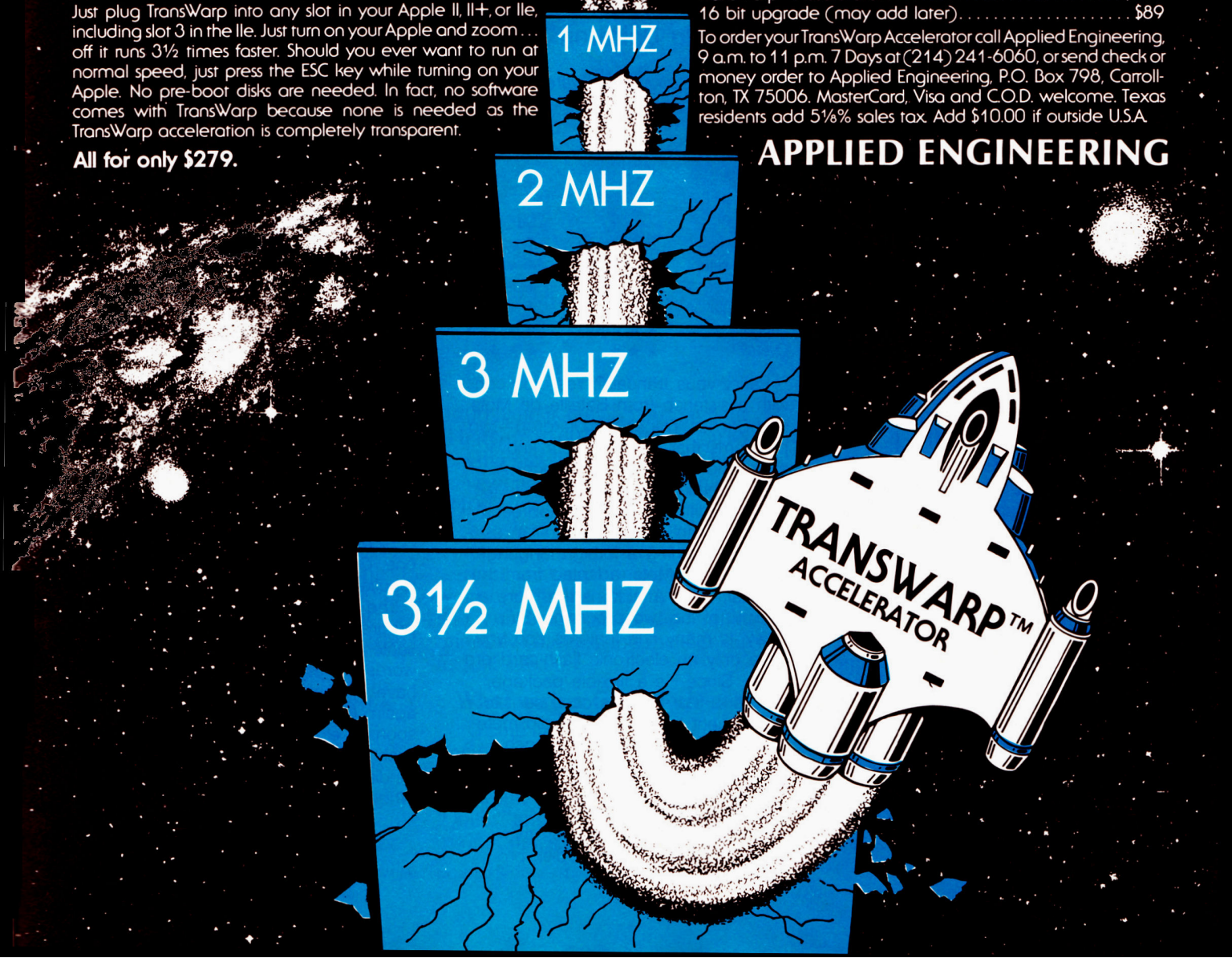

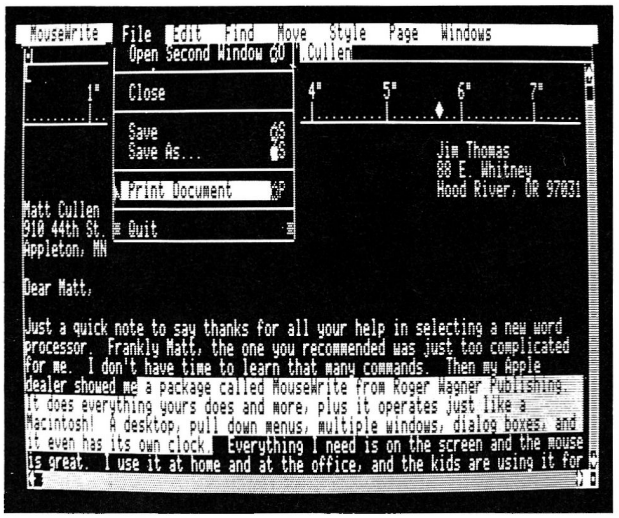


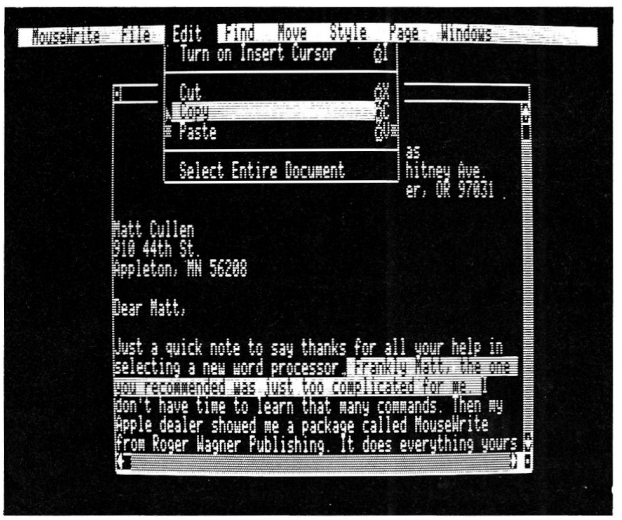


*MouseWrite features Mac-like pull-down menus for editing and formatting.*

MouseWrite's most likable quality is the way it operates like a typewriter. There's a scale (called the ruler) at the top of the 80-column workspace that makes it easy to set margins. The ruler and the text window below it have the friendly and familiar look of a page of paper in a typewriter. You can easily get a feel for what the finished document will look like.

The documentation is divided between tutorial and reference sections. Experienced word-processor users would probably be more comfortable learning the system from the reference material and index rather than the tutorial, which is directed toward the needs of first-time users.

The real problem with MouseWrite is the mouse. Let's hope MouseWrite makes a reappearance someday as a straight word processor without any gimmicks.■

***Brian J. Murphy***
***Fairfield, CT***

*Editor's note: We liked MouseWrite more than Brian Murphy did—it was our Editors' Choice in July 1985 (p. 112). The Macintosh-style interface, as implemented in MouseWrite and other new Apple II software, means more than merely moving the cursor with a mouse. For example, the Mac interface requires that every command be available at all times on the screen display. Look for a detailed review of Mac-style software in April's* inCider.

## **Bataille de Mots** and **Snooper Troops: Sur les Traces du Deirdron**

*Gessler Educational Software*
900 Broadway
New York, NY 10003

Educational game
Any Apple II
$49.95 each

| | Bataille | Sur les Traces |
|---|---|---|
| Ease of setup | ★★★★ | ★★★ |
| Ease of use | ★★★ | ★★★ |
| Documentation | ★★ | ★★ |
| Support | ★★ | ★★ |
| Overall | ★★★ | ★★★ |

Parlez-vous francais? Yes, you can with assistance from Bataille de Mots and Sur les Traces du Deirdron—two programs that enhance your knowledge and enjoyment of French. Although these two software packages entertain different learning approaches, they both emphasize the fun aspects of learning a foreign language.

Bataille de Mots, adapted from the popular Word Attack!, is the more academic of the two programs. Strip away its many fine features and you have only an electronic flash-card program. Since it's a flexible package, teachers and students can use it to supplement the text and audio materials associated with most French courses.

### The French Connection

Bataille de Mots comes on two disks. The main program disk provides an introduction and a built-in editor that lets you create your own vocabulary lists for tailor-made games. Somewhat crude and outdated, the editor uses dot commands (such as .s for save) and control codes for capitalizing letters. Apple //e and //c users may find this method unwieldy.

The data disk contains 18 preprogrammed word lists. It also contains three lists (nouns, adjectives, and verbs) in six topics: dining, sports, trips, school, jobs, and daily life.

Each topic contains four learning activities. The conventional flash-card-type word display shows you up to 25 words—each used in a French sentence and provided with its English translation. A multiple-choice quiz helps you pick out the French/English equivalents.

The sentence-completion activity is the real challenge. Based on the context of the sentence, you must fill in the blank with the correct noun, verb, or adjective. Press the H key for help. The program offers you four choices; you type in the appropriate one. Control codes let you insert the required accents.

The program times and rates your progress in the multiple-choice and sentence-completion sections. Missed words are listed at the end, and you have the opportunity to try the lesson again. For reinforcement, correct responses elicit ego-boosting accolades such as "superbe" and computer renditions of various French songs. When was the last time your teacher

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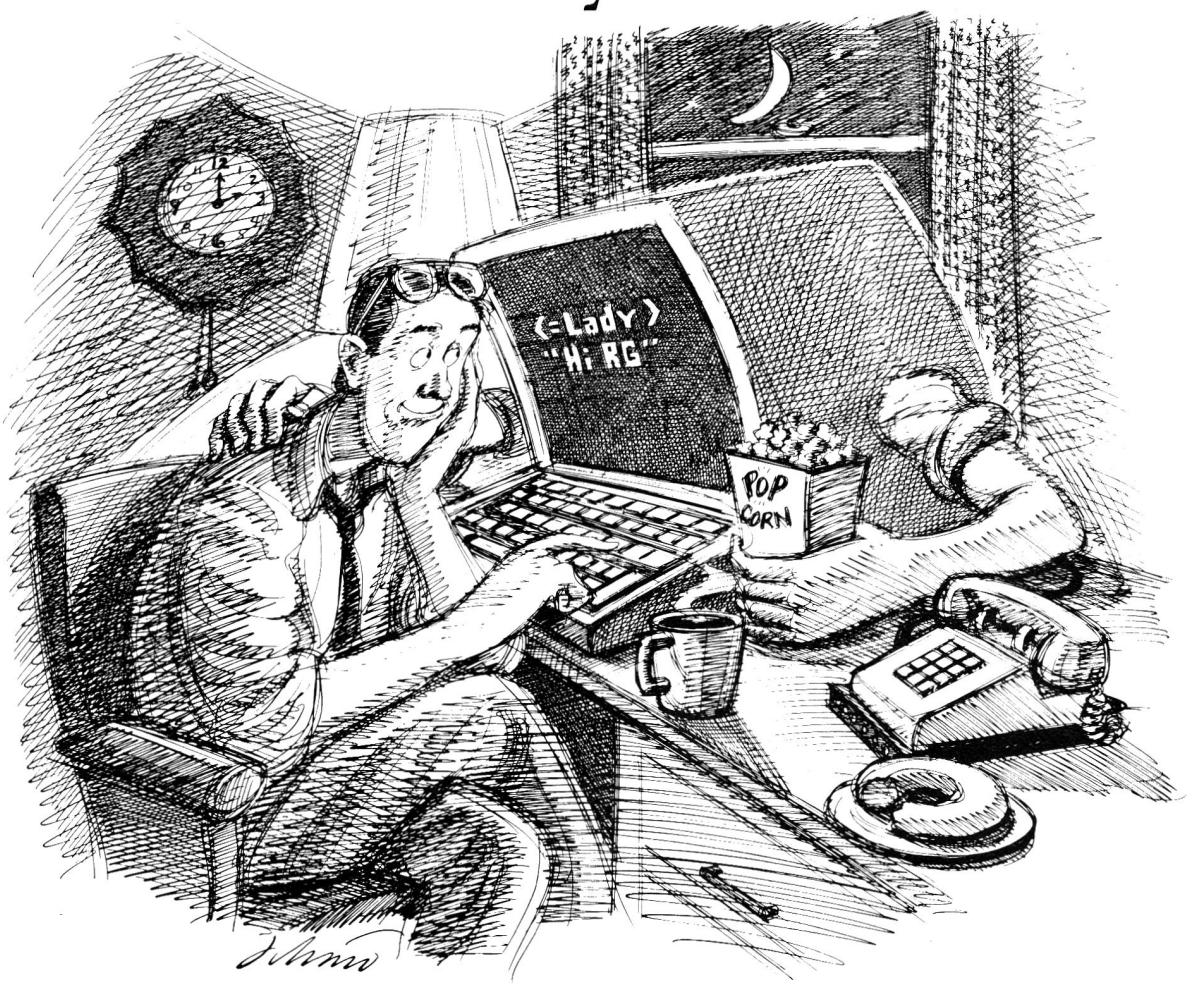


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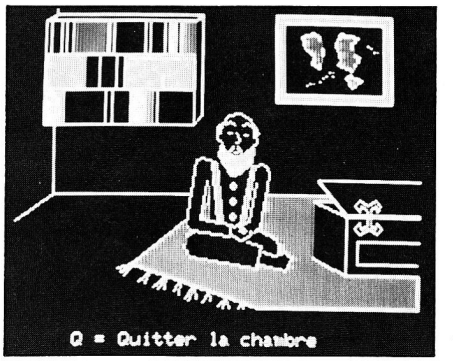


*Sur les Traces du Deirdron promotes the development of learning skills along with French vocabulary.*

hummed a refrain from *La Marseillaise* when you answered a question correctly?

The fourth learning activity, Bataille de Mots, is a self-paced arcade game. A carefree French sprite flips his beret in the air and zaps the French word that most closely matches its English counterpart at the bottom of the screen. You can use the keyboard or joystick for this activity.

The documentation—both written and on screen—is in English. This isn't the case when you open the Sur les Traces du Deirdron package—the user's manual and disk material are in French.

### Interpretations

Some things are lost in translation, they say. But in this version of In Search of the Most Amazing Thing, only the names have been changed to reflect French *savoir faire*. Uncle Smoke Bailey, your mentor, is now Oncle Archibald Aquin. The B-liner, the vehicle you maneuver in search of the Secret of the Universe, is now l'Astrovelle.

As in the English version, the monetary system is based on colored chips. You must use your chips wisely to purchase the equipment, supplies, and software you need to bargain with the people of the Darksome Mire. Once you locate le Deirdron, its location changes so that you can play the game again.

Like its English precursor, Sur les Traces du Deirdron encourages the development of problem-solving, decision-making, and mapping skills. The *pièce de résistance* for American explorers is the foreign-language reading comprehension and vocabulary development this French version nurtures.■

*Cynthia E. Field*
*Wakefield, RI*

## MicroExpert

*McGraw-Hill Book Company*
*Professional and Reference Division*
1221 Avenue of the Americas
New York, NY 10020

Expert-system generator
Any 64K Apple II, 80 columns, disk drive
$49.95

| | |
|---|---|
| Ease of setup | ★★ |
| Ease of use | ★ |
| Documentation | ★★ |
| Support | ★ |
| Overall | ★ |

Those of you who fear losing your jobs to expert systems may find some comfort in the knowledge that although this may still happen, it won't happen because of MicroExpert.

Despite first appearances, MicroExpert is not an expert system itself—it's a tool for developing expert systems. That is, the product is designed to help you build a knowledge data base and a series of questions and logical deductions that will let someone else access this knowledge. The license agreement prohibits the distribution of any expert system developed with MicroExpert without written permission from McGraw-Hill, and perhaps a fee. This severe limitation may be a blessing in disguise, however, for any expert system you create with this product will almost certainly be awkward and unrefined.

MicroExpert supports only one decision structure—the if. . .then conditional. In other words, to reach any conclusion with the system, you must answer a series of biconditional questions. Although this works for the four demonstration problems, most real-world applications require more complex decisions. Even a simple question like "What color is the traffic light (red, green, or yellow)?" is beyond the capability of this system without writing a complex chain of IF. . .THEN statements.

You can modify MicroExpert to include your own routines. To do this you must first obtain a copy of the Apple Pascal compiler (it's not supplied with the package, and it costs an extra $250), then write your own utilities. Programmers this adept at working with Pascal, however, should be able to construct their own expert systems with no help from MicroExpert.

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*SuyftCard creator Jef Raskin and Apple II creator Steve Wozniak*

### SwyftCard transforms the Apple IIe into the computer it ought to be.

The SwyftCard creates a 40K-byte working space, or "universe," capable of holding about 20 pages of single-spaced text. The universe accepts whatever you put in — text, numbers and data, in any form you choose, without you having to switch programs or modes.

Throughout your workday, you can enter information into the universe in free form: a report, names and addresses, daily to-do list, new telephone numbers, client list — anything you're working on.

A universe resides in memory while you are using it, and when you are done you save it to a disk. An unlimited number of universes can be created, each kept on a separate disk.

The secret to working in a SwyftCard universe is the patent-pending cursor. It works faster than control keys or a mouse, and doesn't make you take your hands off the keyboard.

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SwyftCard communicates with data services without you having to learn their editors, and lets you directly edit information you bring in without special commands or file transfers.

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Using the SwyftCard-ProDos utility disk, which is included, you can transfer information developed in SwyftCard to other programs, and vice versa.

SwyftCard is not a spreadsheet, nor will it do everything for everybody. But no other system delivers the common sense utility of SwyftCard.

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# Information Appliance Inc.

One of the most maddening things about MicroExpert is the package hype, which loudly proclaims that you've supposedly purchased a program that can "organize your knowledge, solve your problems, test your new ideas, answer your ifs, whys, and hows." Instead, you get a poorly printed 81-page manual and two disks of digitized snake oil—a simplistic Pascal program and a stripped-down version of the UCSD p-System. And to add to your despair, the documentation doesn't list a telephone number for technical support. You might expect this sort of thing from some home-brew software operation, but not from a publisher the size of McGraw-Hill.

Systems like MicroExpert are potentially effective learning tools for students of artificial intelligence, but this particular product is not geared for AI novices. You'd certainly learn more by reading a good magazine article on AI—or even by watching reruns of *Star Trek*. MicroExpert is unsophisticated and of no practical value—its single redeeming feature is that the disks aren't write-protected, so you can use them to store back-up copies of Missile Command.■

*James McKelvey*
*London, England*

## Real Estate Analyzer

*HowardSoft*
1224 Prospect Street
Suite 150
La Jolla, CA 92037

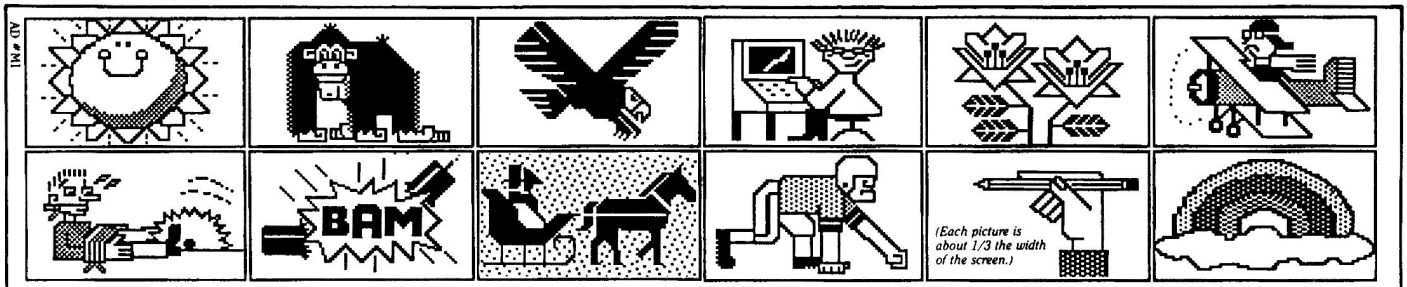
Investment software
Any 64K Apple II
$295

| | |
|---|---|
| Ease of setup | ★★★ |
| Ease of use | ★★★ |
| Documentation | ★★★ |
| Support | ★★★ |
| Overall | ★★★ |

Real Estate Analyzer can't infect you with a love of the land, nor can this newly updated software point you toward successful investment properties. But Real Estate Analyzer can perform the tedious computations essential to the preliminary process of screening property. In less than 15 minutes, you can see the results of various cash-flow and return-on-investment (ROI) analyses for any piece of real estate.

Like title attorneys and mortgage lenders, HowardSoft commands an apparently steep price for its services. Yet, if you're an investor who considers hundreds of properties a year, it will cost you less than the price of a candy bar to analyze each lot, condo, or hotel. When even just applying for a mortgage sets you back more than $200, Real Estate Analyzer is a bargain.

The 16-chapter manual is a primer on the financial aspects of investing in real estate. Studying this manual will help you use Real Estate Analyzer to its full potential. The book includes tutorial and reference sections, and chapters dealing with real-estate tax law, creative financing, partnerships, and new construction projects. Chapter 7 contains worksheets you can reproduce on a copier or ditto machine.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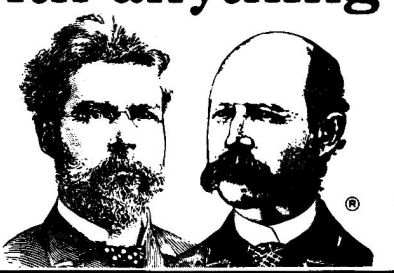

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These forms parallel the ones you see on screen when you use Real Estate Analyzer.

Before starting the program, you must gather information about each property (purchase price, market value, original equity), loans (amount, interest rate, type), capital expenses and depreciation (starting date, basis, method), monthly income, and scheduled expenses (taxes, utilities, condo fees, and so on). That's the easy part.

The grit-your-teeth-and-hope-for-the-best worksheet is the Assumptions for Analysis form. This is the true test of your prowess as an investor. You have to be pretty astute to predict future inflation rates and property-value appreciation.

Real Estate Analyzer prints reports in any number of formats, depending on your needs or your lender's or partner's needs. The program can professionally package all reports with an impressive title page.

### The Bottom Line

With reports in hand, you can readily compare two or more properties or perform "what if" analyses on the same property. For instance, Real Estate Analyzer will show you the short- or long-term effects of choosing one type of mortgage over another.

The Cash Flow Analysis section looks at operating income, expenses, and debt service. From here, Real Estate Analyzer moves a giant step further. The program takes pretax cash flow, calculates depreciation, investment tax credits, and income-tax payments, and presents you with the bottom line—the after-tax cash flow.

Such tax avoidance (not evasion) is what the real-estate game is all about for some folks. And because Uncle Sam frequently changes his mind about things like the useful life of a property and methods of depreciation, HowardSoft offers reduced-price updates of Real Estate Analyzer.

The ROI Analysis section takes a longer-term view. It looks at your pretax and after-tax profits on selling the property, and calculates investment attributes like capitalization rate, cash on cash, and net present value. After-tax rates on return include the classic return on original equity, the internal rate of return, and the financial-management rate of return.

Depending on your system's working memory, you can project both cash flow and ROI analyses for up to 30 years into the future.

Real Estate Analyzer gives each property a file name, under which it conveniently stores the data and analyses for each property for later editing or printing. Two drives aren't necessary, but they make the program more convenient.

Real Estate Analyzer is written under a modified DOS 3.3 called Diversi-DOS. Although you can copy the program, you can't install it on an exclusively ProDOS hard-disk drive.

You could reproduce most Real Estate Analyzer features with a spreadsheet program and word processor, but only after considerable effort. If your love of the land surpasses your love of computing, Real Estate Analyzer may be the silent partner you've been looking for.■

*Cynthia E. Field*
*Wakefield, RI*


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| Music Construction Set | 25.00 |
| Pinball Construction Set | 22.00 |
| Reach for the Stars or Bard's Tale | 29.00 |
| 7 Cities of Gold or Skyfox | 25.00 |
| Software Golden Oldies | 22.00 |
| **EPYX** | |
| Ballblazer or Rescue on Fractulus | 24.00 |
| Summer Games II or Winter Games | 24.00 |
| Temple of Apshai Trilogy | 24.00 |
| World's Greatest Baseball | 21.00 |
| World's Greatest Football | 24.00 |
| **Firebird** Elite | 42.00 |
| **Hayden Software** | |
| Computer Novel Construction Set | 30.00 |
| Sargon III | 30.00 |
| Holy Grail or Inca | 30.00 |
| **Infocom** A Mind Forever Voyaging | 26.50 |
| Cutthroats or Seastalker | 23.50 |
| Deadline or Starcross or SpellBreaker | 28.50 |
| Hitchhiker's Guide to The Galaxy | 23.50 |
| Infidel or Sorceror | 26.50 |
| Witness, Planetfall, or Enchantor | 23.50 |
| Zork I or Wishbringer | 23.50 |
| Zork II, Zork III, or Suspect | 26.50 |
| **Micro League Sports** | |
| Micro League Baseball | 24.00 |
| General Manager/Owner Disk | 24.00 |
| **Microprose** | |
| Solo Flight or Nato Commander | 21.00 |
| F-15 Strike Eagle or Acrojet | 21.00 |
| Gunship or Silent Service | 21.00 |
| Crusade in Europe or Conflict in Vietnam | 25.00 |
| **Mindscape** | |
| Deja Vu: "A Nightmare Comes True" | 34.00 |
| James Bond: "A View To Kill" | 24.00 |
| Racter | 27.00 |
| Rambo: "First Blood Part II" | 24.00 |
| Stephen King's "The Mist" | 24.00 |
| The Halley Project | 27.00 |
| **Muse** Beyond Castle Wolfenstein | 19.00 |
| **One Step** Golf Best | 30.00 |
| **Origin Systems** | |
| Mobius or Autoduel | 32.00 |
| Ultima III: Exodus or Ultima IV | 36.00 |
| **Penguin** The Quest or Ring Quest | 20.75 |
| Expedition Amazon or Xyphus | 20.75 |
| Sword of Kadash or The Crimson Crown | 20.75 |
| **Random House** Alpine Encounter | 24.00 |
| **Sierra-On-Line** | |
| Kings Quest or King's Quest II | 30.00 |
| The Black Cauldron | 24.00 |
| **Simon & Schuster** | |
| Super Zaxxon or Frogger 3 Deep | 21.00 |
| Spy Hunter or Tapper | 27.00 |
| **Sir-Tech** Wizardry | 29.00 |
| Knight of Diamonds | 21.00 |
| Legacy of Llylgamyn | 24.00 |
| Rescue Raiders | 21.00 |
| Wisiprint | 15.00 |
| **Spectrum Holobyte** Gato | 22.00 |
| **Synapse Software** Brimstone | 27.00 |
| Mindwheel | 27.00 |
| Essex | 27.00 |
| **Strategic Simulations** | |
| Baltic 85 or Gemstone Warrior | 20.50 |
| Battalion Commander | 24.00 |
| Battle For Normandy | 24.00 |
| 50 Mission Crush or Broadsides | 23.50 |
| Geopolitique 1990 or Rails West | 23.50 |
| Germany 1985 or Carrier Force | 35.50 |
| Imperium Galactum | 23.50 |
| Kampfgruppe or Reforger 88 | 35.50 |
| North Atlantic '85 | 35.50 |
| Operation Market Garden | 30.00 |
| Objective Kursk or Phantasie | 23.50 |
| War in Russia | 47.50 |
| **Sublogic** Flight Simulator II | 31.00 |
| **Tellarium** Amazon or Dragon World | 24.00 |
| Fahrenheit 451 or Shawdow Keep | 24.00 |
| Nine Princes in Amber | 24.00 |
| Perry Mason: Mandarin in Murders | 24.00 |
| Rendezvous with Rama | 24.00 |
| **Windham Classics** Below the Root | 19.00 |
| Swiss Family Robinson | 19.00 |
| Treasure Island | 19.00 |
| Wizard of Oz | 19.00 |

## Utility/Language Software

| | |
|---|---|
| **Apple Computer** | |
| Apple II Instant Pascal | 105.00 |
| Apple Pascal 1.2 | 199.00 |
| **Borland** Turbo Pascal 3.0 | 37.00 |
| Turbo Database Tool Box | 29.00 |
| Tubo Tutor | 21.00 |
| **Beagle Brothers** Beagle Basic | 19.00 |
| Beagle G.P.L.E. | 27.00 |
| Big U | 19.00 |
| D-Code or Extra K | 22.00 |
| Disk Quick or I.O. Silver | 16.00 |
| Dos Bos or Silicon Salad | 13.00 |
| Double Take or Pro-Byter | 19.00 |
| Fat Cat | 19.00 |
| Pro-Byter | 19.00 |
| Pronto Dos or Utility City | 16.00 |
| Triple Dump | 21.00 |
| **Funk Software** | |
| Sideways Prodos & Dos 3.3 | 32.00 |
| **Lazerware** Lisa V2.6 | 53.00 |
| **Microsoft** Applesoft Compiler | 105.00 |
| Basic Compiler | 239.00 |
| **Quality Software** | |
| Bag of Tricks II | 29.00 |
| **Roger Wagner** Merlin Pro | 57.00 |
| Merlin Assembler | 35.00 |
| Merlin Combo Pack | 64.00 |
| **Software Masters** | |
| Visible Computer: 6502 | 29.00 |
| **The Byte Works** | |
| ORCA/M Macro Assembler | 59.00 |
| **Videx** AppleWorks Modify Plus 64K | 39.00 |
| AppleWorks Modify Plus 128K | 49.00 |
| **Vilberg Brothers** DMP Utilities | 42.00 |

## Graphics Packages

| | |
|---|---|
| **Activision** Game Maker | 30.00 |
| **Baudville** | |
| Actors & Actions or Heros & Villians | 18.00 |
| Blazzing Paddles | 27.00 |
| Prince (C. Itoh or Epson) | 42.00 |
| Pix-It | 29.00 |
| Shape Library 1, 2, or 3 | 12.95 |
| Take 1 | 34.00 |
| **Beagle Brothers** Beagle Graphics | 32.00 |
| Flex Text or Frame Up | 16.00 |
| Font Mechanic | 16.00 |
| Minipix Disk #1 | 16.00 |
| Shape Mechanic | 22.00 |
| **Broderbund** Dazzle Draw | 36.00 |
| Fantavision | 29.00 |
| Print Shop | 29.00 |
| Print Shop Companion | 24.00 |
| Print Shop Graphics Library I, II, or III | 14.95 |
| Print Shop Paper Refill | 12.95 |
| **Data Transforms** Fontrix 1.5 | 54.00 |
| Font Paks 1-13 ea. | 11.25 |
| **Electronic Arts** Movie Maker | 26.00 |
| **Penguin Software** | |
| New Complete Graphics System | 47.00 |
| The Graphics Magician | 35.00 |
| **Simon & Schuster** | |
| Great INTL Paper Airplane Const. Kit | 22.00 |
| **Springboard** Newsroom | 32.00 |
| Newsroom Clip Art Collection Vol. 1 | 17.00 |
| Graphics Expander Vol. 1 | 24.00 |

## Communications

| | |
|---|---|
| **Apple Computer** | |
| Access / / (/ /e/ /c only) | 59.00 |
| **Compuserve** | |
| Compuserve Starter Kit | 15.00 |
| **Dow Jones** Spreadsheet Link | 145.00 |
| **Microstuff** Crosstalk | 102.00 |
| **Quark** Terminus / /e | 55.00 |
| **Softronics** Softerm II | 124.00 |
| **Software Publishing** PFS: Access | 44.00 |
| **Source Telecomputing** | |
| The Source On-Line Information Network | 30.00 |
| **United Software Industries** | |
| ASCII: Express Professional Prodos | 76.00 |

## Business Software

| | |
|---|---|
| **Advanced Logic Systems** | |
| SpellWorks | 32.00 |
| The Handlers (II+ ,/ /e,/ /c) | 97.00 |
| **Apple** Apple Works (/ /e, / /c) | 189.00 |
| Apple Writer / / 2.0 ProDos (/ /e, / /c) | 115.00 |
| Quickfile (/ /e only) | 75.00 |
| **Applied Software Technology** | |
| Versaform / /e, / /c | 48.00 |
| **Arrays/Continental Software** | |
| Home Accountant / /e | 39.00 |
| Home Accountant / /c | 42.00 |
| G/LA/RA/P Payroll ea. | 133.00 |
| Tax Advantage | 41.00 |
| **Artsci** MagiCalc ProDos | 79.00 |
| Magic Office System | 125.00 |
| Magic Window II | 79.00 |
| **BPI Systems** | |
| General Accounting Dos 3.3 | 199.00 |
| AR/AP/PR or Inv. Dos 3.3 (ea.) | 199.00 |
| BPI General Accounting ProDos | 219.00 |
| BPI AR/AP/PR or Inv. ProDos (ea.) | 219.00 |
| **Broderbund** | |
| Bank Street Writer or Speller | 41.00 |
| Bank Street Filer or Mailer | 41.00 |
| **CBS Software** Stockpak II | 89.00 |
| **Dow Jones Software** | |
| Membership Kit | 19.00 |
| Investor's Workshop | 89.00 |
| The Market Analyzer or Microscope | 199.00 |
| The Market Manager | 149.00 |
| **Electronic Arts** Cut and Paste | 22.00 |
| Financial Cookbook | 32.00 |
| **First Star** The Works | 30.00 |
| **Hayden Software** | |
| The Writer | 27.00 |
| **Human Edge Software** | |
| Communications or Management Edge | 88.00 |
| Mind Prober | 27.00 |
| Mind Over Minors | 35.00 |
| Sales or Negotiation Edge | 88.00 |
| **Howardsoft** | |
| Real Estate Analyzer III w/Tax Preparer | 189.00 |
| **International Solutions** | |
| MouseBudget | 42.00 |
| MouseCalc | 92.00 |
| MouseDesk | 24.00 |
| MouseWord | 79.00 |
| **Intuit** Quicken | 49.00 |
| **Kensington Microware** | |
| Format II Enhanced | 88.00 |
| **Living Videotext** | |
| Think Tank II+ or / /e | 79.00 |
| **Manzanita** | |
| BusinessWorks Master Module | 69.00 |
| GL/AR/AP/ or Inventory Module | 259.00 |
| Payroll Module | 295.00 |
| **MECA** Managing Your Money | 105.00 |
| **Megahaus** MegaWorks | 69.00 |
| ReportWorks | 69.00 |
| **Monogram** | |
| Dollars and Sense (II+ ,/ /e) | 58.00 |
| Dollars and Sense (/ /c) | 68.00 |
| Forecast (64K or 128K) | 36.00 |
| **Nolo Press** Will Writer | 29.00 |
| **Organizational Software** Omnis 3 | 229.00 |
| **Paladin** Flashcalc | 59.00 |
| **PBI Software** Graphworks 1.2C | 59.00 |
| Jeeves | 38.00 |
| **Peachtree** | |
| Back To Basics: GL/AR/AP | 105.00 |
| **Pinpoint Publishing** Pinpoint | 37.00 |
| **Practicorp** Practicalc II | 27.00 |
| **Precision Software** SuperBase | 59.00 |
| **Quark** Catalyst / /e V3.0 | 95.00 |
| Word Juggler & Lexicheck / /e | 65.00 |
| **Roger Wagner Publishing** | |
| Mouse Write | 75.00 |
| The Write Choice | 27.00 |
| **Satellite Software** Wordperfect | 79.00 |
| **Sensible Software** | |
| Bookends—ProDos | 79.00 |
| Graphics Department | 69.00 |
| Sensible Grammar | 55.00 |
| Sensible Speller—Dos or ProDos | 69.00 |
| **Sierra On-Line** | |
| General Manager II | 129.00 |
| Homeword or Homeword Filer | 42.00 |
| Homeword Speller | 30.00 |
| Screenwriter Professional | 77.00 |
| **Simon & Schuster** | |
| JK Lasser's Money Manager | 49.00 |
| **Software Publishing** | |
| PFS: First Success | 128.00 |
| PFS:File, Graph, Report | 69.00 |
| PFS:Write or Plan (/ /e, / /c) | 69.00 |
| **Sorcim/IUS** SuperCalc 3a | 105.00 |
| **State of the Art** | |
| Electric Checkbook | 59.00 |
| GL/AR/AP/Inventory/Payroll | 289.00 |
| **Stoneware** | |
| DB Master Business Team | 189.00 |
| DB Master Business Writer | 89.00 |
| DB Master Version Four Plus | 169.00 |
| **TimeWorks** | |
| Silvia Porter's Financial Planner | 68.00 |
| Swiftcalc with Sideways | 105.00 |

## Educational Software

| | |
|---|---|
| **Addison Wesley** Smart Eyes | 36.00 |
| **Apple** | |
| Apple Logo / / 128K (/ /e, / /c only) | 79.00 |
| **Bantam Books** | |
| Fantastic Animals or Road Rally USA | 24.00 |
| The Complete Scarsdale Medical Diet | 24.00 |
| **Baron's** Computer SAT | 53.00 |
| **Brainpower** Chipwits | 24.00 |
| Think Fast | 24.00 |
| **Broderbund** | |
| Science Tool Kit Master Module | 36.00 |
| **CBS Software** Adventure Master | 26.00 |
| America Coast to Coast | 24.00 |
| Body in Focus | 24.00 |
| Dinosaur Dig | 24.00 |
| Forecast! or T-Rex | 29.00 |
| Goren's Bridge | 49.00 |
| Mastering The SAT | 59.00 |
| Success w/Algebra (ea.) | 21.00 |
| Success w/Math (ea.) | 15.00 |
| **Davidson & Associates** | |
| Alge-Blaster | 28.50 |
| Classmate or Math Blaster | 28.50 |
| Speed Reader II | 40.50 |
| Speed Reader Data A, B, C, or D | 11.95 |
| Spell-It or Word Attack! | 28.50 |
| **Designware** | |
| European Nations & Locations | 26.00 |
| Grammer Examiner | 26.00 |
| Remember | 45.00 |
| Spellicopter or Spellakazam | 24.00 |
| States & Traits or Mission Algebra | 26.00 |
| The Body Transparent | 26.00 |
| **DLM** | |
| Alligator Mix or Demolition Division | 20.00 |
| Create with Garfield! or Fraction Fuel Up | 19.00 |
| Freddie's Puzzles or Number Farm | 19.00 |
| Spelling Wiz or Word Invasion | 20.00 |
| **Fisher Price** | |
| Alpha Build or Logic Levels | 16.00 |
| First Man on the Moon | 18.00 |
| Peter Rabbit Reading | 18.00 |
| **Goller Publishing** EduCalc | 30.00 |
| Friendly Filer or Easy Graph | 24.00 |
| Science Island or Treasure Hunter | 24.00 |
| **Harcourt Brace** Computer SAT | 46.00 |
| **Learning Company** | |
| Addition Magician | 21.00 |
| Bumble Plot or Reader Rabbit | 24.00 |
| Gertrude's Puzzles or Secrets | 26.00 |
| Juggle's Rainbow | 18.00 |
| Magic Spell or Word Spinner | 21.00 |
| Moptown Hotel or Number Stumper | 24.00 |
| Robot Odyssey or Rocky's Boots | 29.00 |
| **MECC** All Titles in Stock! | Call |
| **Milliken** | |
| Addition or Division Sequences | 21.00 |
| The Milliken Word Processor | 42.00 |
| **Mindscape** Crossword Magic | 30.00 |
| Keyboard Cadet or Luscher Profile | 24.00 |
| Perfect Score SAT | 42.00 |
| Tink's Adventure, Mazes or Sub. Fair | 18.00 |
| **Peachtree/Eduware** | |
| Algebra 1, 2, 3, or 4 | 21.00 |
| Algebra 5 or 6 | 26.00 |
| Compu-Read | 16.00 |
| Compu-Math: Arithmetic Skills | 29.00 |
| Introduction to Counting | 23.00 |
| PSAT or SAT Word Attack Skills | 16.00 |
| PSAT/SAT Analogy | 18.00 |
| Spelling Bee w/Reading Primer | 22.00 |
| Writing Skills 1, 2, 3, 4 or 5 | 23.00 |
| **PinPoint** Micro Cookbook (II+ , / /e) | 27.00 |
| Appetizers, Deserts, Soups & Salads | 11.95 |
| **Random House** | |
| Charlie Brown Typing is a Ball | 24.00 |
| Garfield Double Dares | 24.00 |
| Garfield Eat Your Words | 24.00 |
| Mr. & Mrs. Potato Head | 24.00 |
| Peanuts Math Matcher | 24.00 |
| Snoopy Writer | 24.00 |
| **Sensible Software** Report Card | 33.00 |
| **Scarborough Systems** | |
| Build A Book About You | 24.00 |
| MasterType New & Improved | 24.00 |
| Mastertype's Writing Wizard | 48.00 |
| Original Boston Computer Diet | 48.00 |
| Picture Writer or Songwriter | 24.00 |
| **Scholastic Wizware** | |
| Agent U.S.A. or Turtle Tracks | 24.00 |
| Fact & Fiction Tool Kit / /c | 23.00 |
| Logo Robot or Kids at Work | 15.00 |
| Math Assistant I or II | 62.00 |
| Microzine 1,2,3,4,5,6,7, or 8 | 23.00 |
| Operation: Frog or Logic Builders | 24.00 |
| Story Tree or Story Maker | 23.00 |
| **Simon & Schuster** Chem Lab | 24.00 |
| Lovejoy's Preparation for SAT | 42.00 |
| Typing Tutor III | 30.00 |
| **Spinnaker** | |
| Adventure Creator or Trains | 18.00 |
| Counting Parade or Sum Ducks | 19.00 |
| Delta Drawing | 24.00 |
| File & Report or Spreadsheet | 35.00 |
| Fraction Fever | 15.00 |
| Grandma's House | 15.00 |
| Homework Helpers: Math Word Problems | 24.00 |
| Homework Helpers: Writing | 24.00 |
| In Search Of.... | 20.00 |
| Kidwriter or Alphabet Zoo | 18.00 |
| Kindercomp or Kids on Keys | 15.00 |
| Mathbusters | 18.00 |

# In Connecticut Call 378-3662 or 378-8293

| | |
|---|---|
| Snooper Troops Case I or II | 20.00 |
| Word Processor | 34.00 |
| **Springboard** | |
| Early Games or Music Maestro | 21.00 |
| Fraction Factory or Make a Match | 18.00 |
| Mask Parade or Easy as ABC | 24.00 |
| Rainbow Painter or Puzzle Master | 21.00 |
| **Terrapin** Terrapin Logo | 57.00 |
| **TimeWorks** | |
| Evelyn Wood Dynamic Reader | 41.00 |
| **Weekly Reader** Chivalry | 29.00 |
| Exploring Tables & Graphs 1 or 2 | 21.00 |
| Pic.Builder | 24.00 |
| Stickybear Series (ea.) | 24.00 |

## Modems

| | |
|---|---|
| **Anchor Automation** | |
| Anchor Signalman Express 1200 | 239.00 |
| Anchor Signalman Lightning 2400 | 349.00 |
| Volksmodem 12 | 179.00 |
| **Apple Computer** | |
| Apple Personal Modem | 289.00 |
| Apple / /e,/ /c, or Mac Cable | 25.00 |
| **Hayes** | |
| Hayes Micromodem / /e | 135.00 |
| Hayes 300 Baud Smartmodem / /c | 159.00 |
| Hayes 300 Baud Smartmodem | 135.00 |
| Hayes 1200 Baud Smartmodem | 368.00 |
| Hayes 2400 Baud Smartmodem | 579.00 |
| **Novation** | |
| Novation Apple Cat II | 199.00 |
| Novation 212 Apple Cat II | 359.00 |
| Novation 212 Upgrade | 219.00 |
| Novation 2400 Baud Standalone Modem | 479.00 |
| **Prentice** | |
| Popcom X-100 (1200 Baud) | 259.00 |
| **Prometheus** | |
| Pro Modem 1200 (External) | 289.00 |
| Pro Modem 1200A (Internal) | 259.00 |
| Pro Modem 300c | 129.00 |
| **U.S. Robotics** | |
| U.S. Robotics Password 1200 | 199.00 |
| U.S. Robotics Courier 2400 | 389.00 |
| **Zoom Telephonics** | |
| Zoom/Modem / /e | 115.00 |
| Zoom/Modem / /e Plus | 125.00 |

## Ramcards/Z80/80 Col.

| | |
|---|---|
| **Advanced Logic Systems** | |
| Add-Ram 16 | 65.00 |
| Add-Ram 80/64 | 52.00 |
| Add-Ram 80/256 | 145.00 |
| Z-Engine 2.2 | 125.00 |
| CP/M Card | 225.00 |
| **Apple Computer** | |
| Apple II Memory Expansion Card | 225.00 |
| Apple / /e Extended 80 Col. Card | 115.00 |
| **Applied Engineering** | |
| RamWorks II (64K to 3MB) | Call |
| Z-Ram / /c (256 or 512K) | Call |
| Ramworks RGB Option & 16 Bit Option | Call |
| **Apricorn** Apricon 64K Extend-It | 89.00 |
| Apricorn 16K Ramcard II+ | 68.00 |
| **Carribbean Computer** | |
| Extend 80 | 78.00 |
| **Checkmate Technology** | |
| Multiview 80/160 | 219.00 |
| Multiram CX Cards | Call |
| 65C816 CX Kit | Call |
| MultiRam / /e Cards | Call |
| Multiram / /EX 65C816 Card | Call |
| **Legend Industries** | |
| Legend E' Card (64K to 1 MB) | Call |
| Legend S' Card (64K to 1 MB) | Call |
| **Micro Sci** Micro Sci 80/64e | 69.00 |
| Micro Sci 80/256e | 149.00 |
| **Microsoft** | |
| Microsoft Premium Softcard / /e | 259.00 |
| Microsoft Softcard II | 265.00 |
| **MTC** MTC Speed Demon | 159.00 |
| **Titan Industries** Saturn 126K Ram | 175.00 |
| Neptune 80 Col. w/64K | 185.00 |
| Accellerator / /e | 225.00 |
| **Videx** Videx Videoterm w/55 Inv. | 178.00 |
| Videx Ultraterm | 189.00 |

## Multifunction Cards

| | |
|---|---|
| **AST Research** Multi I/O Card | 155.00 |
| **Checkmate Technology** Gambit | Call |
| **Prometheus** Versacard | 135.00 |
| **Quadram** Multicore w/256K | 295.00 |
| Extended Multifunction Board | 179.00 |
| **Street Electronics** | |
| Business Card Parallel | 159.00 |
| Business Card Serial | 139.00 |
| **Videx** PS10 Dual Function Interface | 135.00 |

## Printer Interface Cards

| | |
|---|---|
| **Apple** | |
| Apple Super Serial Card | 109.00 |
| **Apricorn** Apricord / /c | 49.00 |
| Super Serial Card | 79.00 |
| **Interactive Structures** | |
| Pkaso/U Interface | 115.00 |
| **Orange Micro** | |
| Serial Grappler Plus | 75.00 |
| Grappler + | 74.00 |
| Buffered Grappler + | 135.00 |
| Grappler / /c | 78.00 |
| Hot Link | 49.00 |
| **Practical Peripherals** | |
| Graphicard | 59.00 |
| PrinterFace | 49.00 |
| Serial Interface Card | 99.00 |
| **Spies Labs** | |
| Nice Print | 109.00 |
| **TextPrint** | |
| Print-It! (Parallel or Serial) | 125.00 |
| **Thirdware** | |
| Finger Print Plus II + ,/ /e,/ /c | 89.00 |

## Clock/Calendar Peripherals

| | |
|---|---|
| **Applied Engineering** | |
| TimeMaster H.O. | 109.00 |
| BSR Interface | 39.00 |
| **Practical Peripherals** | |
| Proclock / /e or / /c | 119.00 |
| **Quadram** | |
| Pro Dos Clock/Calendar Card | 65.00 |
| **Creative Peripherals** | |
| Seiko Datagraph 2001 w/Time Trax | 149.00 |
| Time Trax / /e or / /c | 79.00 |
| / /c System Clock | 55.00 |
| **Street Electronics** Livewire w/clock | 72.00 |
| **Thunderware** Thunderclock | 105.00 |

## Video Cards

| | |
|---|---|
| **Video 7** | |
| Color Enhancer / /e w/Dazzle Draw | 119.00 |
| Color Enhancer / /c | 89.00 |
| Screen Enhancer / /e | 89.00 |
| Screen Enhancer / /c | 49.00 |
| Mappler Interface | 35.00 |

## Accessories

| | |
|---|---|
| Kensington System Saver | 60.00 |
| Cool + Time | 69.00 |
| Curtis Diamond | 30.00 |
| Curtis Emerald | 36.00 |
| Curtis Ruby | 54.00 |
| Curtis Sapphire | 47.00 |
| Apple Mouse / /e | 115.00 |
| Apple Mouse / /c | 79.00 |
| Hayes Mach II Joystick | 27.00 |
| Hayes Mach III Joystick | 33.00 |
| Kraft Quickstick / /c | 49.00 |
| Kraft Joystick | 31.00 |
| Gibson Light Pen | 149.00 |
| Digital Paintbrush System | 175.00 |
| Muppet Learning Keys | 42.00 |
| Koala Pad Plus | 72.00 |
| KeyTronic Keyboard KB-200 | 225.00 |
| Trackhouse Keypad | 79.00 |
| Mockingboard A Board | 70.00 |
| Mockingboard C Board | 120.00 |
| Mockingboard D Board (/ /c) | 130.00 |
| Echo II Plus | 94.00 |
| The Cricket / /c | 115.00 |
| Hanzon Universal Data Buffer | 289.00 |
| Rainbow Paper Pak (300 sheets) | 12.00 |

## Blank Media

| | |
|---|---|
| Elephant SS/DD (10) | 11.95 |
| Maxell SS/DD (10) | 13.95 |
| Verbatim SS/DD (10) | 13.95 |
| BASF SS/DD (10) | 10.50 |
| Memorex SS/DD (10) | 13.50 |
| 3M SS/DD (10) | 16.95 |
| Dysan SS/DD (10) | 22.95 |

## Printers

| | |
|---|---|
| **Apple** | |
| ImageWriter II Color Printer | 459.00 |
| ImageWriter II 32K Buffer | 79.00 |
| ImageWriter II Cut Sheet Feeder | 175.00 |
| ImageWriter (Wide Carriage) | 475.00 |
| **Brother** HR-15XL | 339.00 |
| HR-25 | 459.00 |
| HR-35 | 679.00 |
| **Fortis/Dynax** | |
| DH45 Dual Head Printer | 859.00 |
| **Citizen** MSP-10 (160 cps) | 249.00 |
| MSP-15 (160 cps) | 369.00 |
| MSP-20 (200 cps) | 339.00 |
| MSP-25 (200 cps) | 509.00 |
| **C.Itoh** ProWriter 8510 SP Plus | 329.00 |
| ProWriter 1500 SP Plus | 469.00 |
| **Epson** | |
| AP-80 (Imagewriter Compatable) | 269.00 |
| LX-80/90 | Call |
| FX-85/185 For | Call |
| DX-10/20 Most | Call |
| JX-80 Recent | Call |
| LQ-800-1500 Low! Low! | Call |
| SQ-2000 Prices | Call |
| **Hewlett-Packard** | |
| ThinkJet, Lazerjet, Lazerjet Plus | Call |
| **Juki** 6000 Par. or Ser. | 179.00 |
| 6100 Par. | 345.00 |
| 6200 Par. | 509.00 |
| 6300 Par. or Ser. | 655.00 |
| **Mannesman Tally** | |
| MT-85 Apple | 345.00 |
| MT-86 Apple | 415.00 |
| **NEC** SpinWriter e.l.f. 360 | 385.00 |
| SpinWriter 2030P (20 cps) | 625.00 |
| SpinWriter 3530P (35 cps) | 989.00 |
| PinWriter P2-2P (180 cps) | 495.00 |
| PinWriter P3-3P (180 cps) | 695.00 |
| **Okidata** Okimate 20 Color Printer | 120.00 |
| Microline 182P | 215.00 |
| Microline 183P | 379.00 |
| Microline 192P | 339.00 |
| Microline 193P | 475.00 |
| Microline 192 Apple | 369.00 |
| Microline 193 Apple | 545.00 |
| **Panasonic** KXP-1091 | 239.00 |
| KXP-1092 | 349.00 |
| KXP-1093 | 409.00 |
| KXP-3151 | 379.00 |
| **Silver Reed** EXP-400P | 209.00 |
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| SG-15 (120 cps) | 379.00 |
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| SR-10 (200 cps) | 489.00 |
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| **Toshiba** P-1340 Parallel | 399.00 |
| P-341 Parallel Only | 899.00 |
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| ProFile (10 Meg) w/Access. Kit | 1139.00 |
| Apple / /c External Drive | 229.00 |
| Apple DuoDisk w/Accessory Kit | 449.00 |
| Apple UniDisk 3.5 w/Apple / / Utilities | 359.00 |
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| Apple Unidisk 3.5 Accessory Kit (II + ,/ /e) | 59.00 |
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| **Micro Sci** A2 Full Height | 159.00 |
| A5 Slimline / /e | 159.00 |
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| Apple Half-Height II +,/ /e, / /c | 139.00 |
| **Quark** | |
| QC-10 Hard Disk / /e, / /c or Mac | 1029.00 |
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| | |
|---|---|
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| Video 300A 12" Amber Monitor | 119.00 |
| Color Monitor 300 (Composite) | 219.00 |
| Color Monitor 500 (RGB) | 255.00 |
| Color Monitor 600 (RGB) | 385.00 |
| DVM III RGB Interface | 119.00 |
| **Apple** | |
| Color Monitor / /e | 289.00 |
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| TR120M1 Hi-Res Green | 110.00 |
| TR120MD Hi-Res Amber | 110.00 |
| DTS101 Dual Mode Color 10" | 165.00 |
| DTH103 10" Super Hi-Res RGB | 369.00 |
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| **Princeton Graphics** | |
| HX-9 9" RGB Color | 399.00 |
| HX-12 RGB 12" RGB Color | 419.00 |
| RGB-80 Interface | 145.00 |
| **Sakata** | |
| SG-1000 Green | 105.00 |
| SA-1000 Amber | 115.00 |
| SC-100 Composite Color | 149.00 |
| SC-200 RGB Color | 379.00 |
| **SWI International Systems** | |
| CVUE Flat-Panel Display / /c | Call |
| **Taxan** | |
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| 116 12" Hi-Res Amber | 115.00 |
| 220 14" Composite Color | 215.00 |
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| 620 12" Hi-Res RGB Color (640x200) | 385.00 |
| 410-80/64 RGB-II Interface | 169.00 |
| **Teknika** | |
| MJ-22 RGB Color Monitor | 289.00 |

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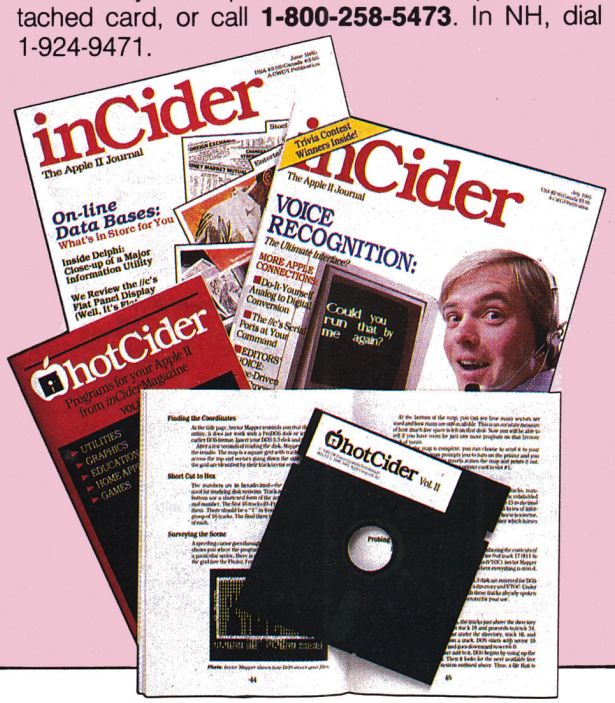


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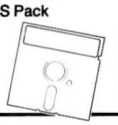

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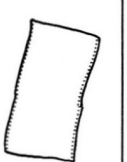

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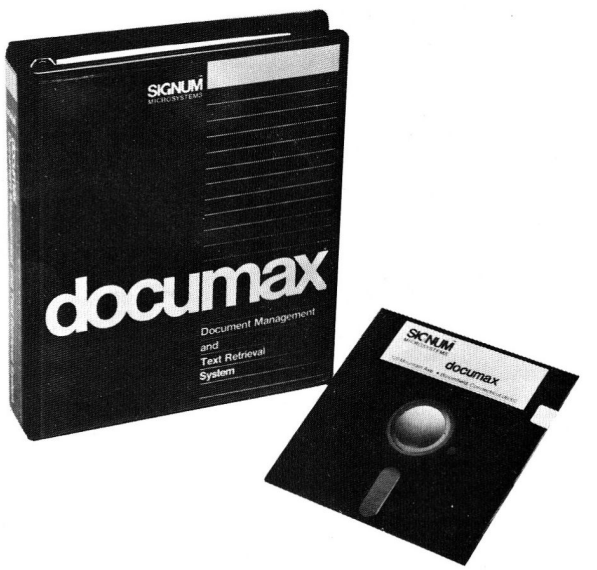
*Product descriptions contained in this section are based on information supplied to us by the respective manufacturers. These announcements are provided solely as a service to our readers and do not constitute endorsement by* inCider *of any given product.*




### Documentary

The Documax **text-management system** lets Apple II users search the full contents of their ProDOS text files and compress text by as much as half of its original bulk. Text management and retrieval facilitates the organization of text files, allows quick inspection with forward and backward scrolling, automatically collects passages on a given subject from existing files into a new file, cuts and pastes across files, and provides simple text editing. Text compression doubles disk capacity and cuts data-transmission costs in half. Documax works with AppleWorks' word processor and Apple Writer, too. The utility costs only $99.95, from Signum Microsystems, 120 Mountain Avenue, Bloomfield, CT 06002, (203) 726-1911. For more information circle number 357 on the Reader Service card.

### Mac or Mouse?

The Kyan MouseText Toolkit lets you add a **Macintosh-like user interface** to your Kyan Pascal programs. Pull-down menus, windows, and mouse-controlled cursor movements can be integrated into your own Apple II programs. The MouseText Toolkit is a series of software routines that utilize mouse menus and text windows, as well as the MouseText icons stored in ROM on the Apple //c and updated //e. Even novice Pascal programmers can use the desktop environment the Mac made famous. You must have programs written in Kyan Pascal to use MouseText Toolkit—$49.95, from Kyan Pascal, 1850 Union Street, San Francisco, CA 94123, (415) 775-2923. For more information circle number 360 on the Reader Service card.

### New Bottles

II in a Mac software **emulates Apple II software on a Macintosh**. The 512K-Mac user can now run thousands of Apple DOS 3.3 and ProDOS programs currently available for the Apple II—public-domain as well as commercial software runs without modification. The package includes communications software for both Mac and II, simplifying the transfer. The emulator includes four disk drives, a RAM disk, joystick, language card, clock, hi-res graphics, and 68000 system calls. Programs run at 35 to 40 percent of speed, for $69.95, from COMPUTER:applications, 12813 Lindley Drive, Raleigh, NC 27614, (919) 846-1411. For more information circle number 355 on the Reader Service card.

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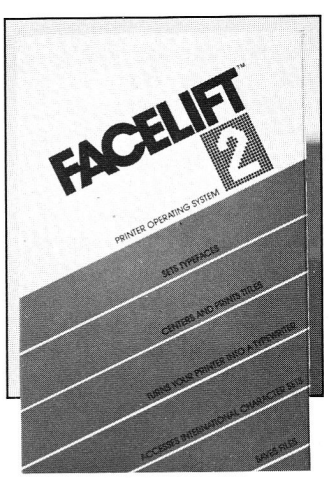
Logicware CADCD offers **computer-aided digital-circuit design**. The software converts Boolean functions into minimum sum of products or minimum product of sums. Logicware CADCD handles up to eight input variables or output functions. You enter Boolean functions as a truth table, which you edit, save to disk, load from disk, or print. CADCD also facilitates machine design, for $59, from Logicware, 2346 West Estrella Drive, Chandler, AZ 85224, (602) 821-2465. For more information circle number 361 on the Reader Service card.

## Save Face

The Facelift 2 Printer Operating System for Epson printers is a **complete printer-utility package**. Facelift 2 is an easy way to get more from your Epson FX, LQ, or SX dot-matrix printer without programming. Faces and Custom Faces functions provide access to all the printer's built-in font sizes, pitches, and patterns. The Keyboard function lets you type from the Apple keyboard directly into the printer. You can center headings and titles without creating special files with the Title function. Document is the Facelift 2's built-in word processor—it saves files for later printing. Facelift 2 costs $49.95, from Companion Software, 7400 West Beverly Boulevard, Suite 270, Los Angeles, CA 90036, (213) 936-6379. For more information circle number 362 on the Reader Service card.




## Space Traders

PSI 5 Trading Company is an **interactive animated space adventure** starring five crew members on board a space freighter out to save the Parvin Frontier from alien invaders. The crew members are portrayed pictorially—with photos of their faces and in their conversations with you and each other. You're the captain and must get everyone to work together—pick your men carefully. The PSI 5 Trading Company ($34.95) is the third in a series of movie-like home-entertainment programs from Accolade, 20863 Stevens Creek Boulevard, Cupertino, CA 95014, (408) 446-5757. For more information circle number 359 on the Reader Service card.

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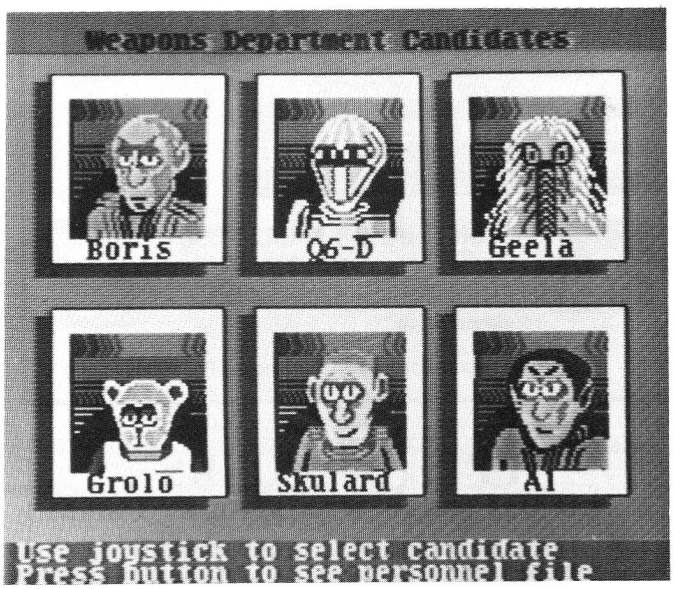


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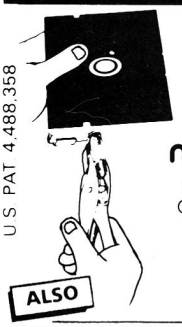

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# NEW PRODUCTS

## Hardware

### Cache Dash

SprintDisk is a **solid-state memory-expansion card** for the Apple //e and II Plus that supports up to 1 megabyte of main-board RAM and includes SprintCache—software that lets programs run at RAM speed without modification. With the addition of an optional piggyback board, it's easy to expand the SprintDisk memory to 2 megabytes. The SprintDisk uses only one slot for 2 megabytes, an important consideration if you want to continue to modify your II. SprintDisk sells for $299 with 256K of RAM, from AST Research, 2121 Alton Avenue, Irvine, CA 92714, (714) 476-3866. For more information circle number 350 on the Reader Service card.

### Rambo

AST's MegaRamPlus lets you add as much as **1 megabyte of main-board RAM** and offers RAM-disk and memory-addressing expansion software as well. The innovative MegaRamCache software package will boost the speed of existing applications, also. MegaRamCache caching builds a buffer the size of the memory installed in the MegaRamPlus card to hold portions of the currently active application and eliminate the need to modify software. MegaRamCache is transparent to applications programs: Off-the-shelf software will run at RAM speed. The board sells for $199, from AST Research, 2121 Alton Avenue, Irvine, CA 92714, (714) 476-3866. For more information circle number 351 on the Reader Service card.

### Text and Pictures

Concept Publishing Systems offers **hardware and software to typeset text, display advertisements, and graphics** on the Apple LaserWriter plain-paper printer. Concept equips the Mac with an internal hard disk, graphics tablet, and pen to enhance the power of its graphics. Driving the LaserWriter at 216 lines per minute, your Apple //e, either alone or in a network, can typeset fully hyphenated, justified text. A five-terminal NewsSet system sells for $43,878, to set you up in publishing. From Concept Publishing Systems, 126 Monroe Street, Beaver Dam, WI 53916, (414) 887-3731. For more information circle number 354 on the Reader Service card.

## Resources

### Deep Data

The *Directory of Online Databases* is a **comprehensive, current guide to every kind of on-line data base**. This information is available to any user with a modem. The directory includes both bibliographic and nonbibliographic data bases, offers expert introductory tutorials in using data bases, and identifies the addresses of data-base producers and on-line service organizations. The book is issued every six months, each volume containing 400 pages and supplemented by updated information once. Indexes make it easy to locate a data base with the material you want and find out how to access it. A one-year subscription sells for $95, from Cuadra/Elsevier, P.O. Box 1672, Grand Central Station, New York, NY 10163, (212) 244-6320. For more information circle number 364 on the Reader Service card.

## Product Updates

● How hot is Broderbund's Print Shop? Beagle Bros' latest catalog offers **Minipix Disk #1**—200 hi-res clip-art pictures for The Print Shop—for $29.95. And Springboard, makers of the competing Newsroom, offers the **Graphics Expander Volume I** ($39.95), 300 new pictures with editing and drawing tools to use with The Print Shop.

● Broderbund isn't letting "fourth-party" developers do all the work. The **Print Shop Graphics Library Disk 39** is here, with 120 new designs, symbols, and pictures. Rocky, Rambo, and The Print Shop: They never stop.

● **Touch Window** from Personal Touch works with The Print Shop now. Also with Broderbund's Dazzle Draw and Fantavision, Mindscape's Color Me, Baudville's Blazing Paddles, Penguin's Graphics Magician, and Koala's Graphics Exhibitor. Not to mention The Newsroom (Springboard), Bank Street Storybook (Mindscape), and Sargon III (Hayden).

● Cauzin Systems has **StripWare** for the Cauzin Softstrip System—John Wiley's **Art and Graphics** on the Apple II and //e and **Basic Apple //c**, for example. Also a volume each for home education and arcade games, a "disk doctor," some computer puzzles, and a balance sheet. Remember—you need the reader to read them.

● **MouseDesk**, from International Solutions, rounds out the MouseCalc-Mouse-Word-MouseBudget line with a desktop organizer and program selector to rival Quark's Catalyst 3.0. What will International Solutions find next in France? MouseDraw? MouseType? Mouse 1-2-3?

● The latest version of **Apple II Pascal, number 1.3**, is significantly different from earlier editions. Apple says fresh disks and manual paste-ins won't make the upgrade—you need the whole kit—disks and 1000-page manual. Before May 16, 1986, owners of Apple II Pascal can send the original disk, labeled PASCAL1, and $125 (half the suggested retail) to Apple Computer Pascal 1.3 Upgrade, P.O. Box 306, Half Moon Bay, CA 94019, to receive the latest version.

● If you have a modem and CompuServe, there's an easy way to get up-to-the-minute info from **Peterson's College Guides**. Just key into Peterson's file on CompuServe (file name PSG) and choose your dream school with the on-screen menu.

● If you use Andrew Tobias' **Managing Your Money** software from MECA, the Chase Manhattan Bank wants to talk to you. Chase's **Spectrum** home-banking service now interfaces telephonically with Managing Your Money. Its features are many, but automatic account reconciliation really stands out.

● **Sun Data** in Logan, Utah (801-752-7631), has agreed with Apple Computer to sell refurbished **Apple ///** computers, software, and accessories, as well as provide support and service to Apple /// owners. Does Sun have any plans for forgotten Lisa owners?

● Activision's **Hacker** challenge—the game begins with nothing more than "LOGON PLEASE"—has moved from the Mac to the Apple II, for $39.95.


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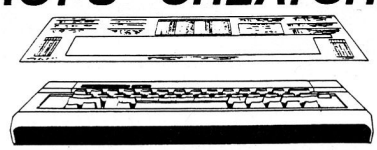

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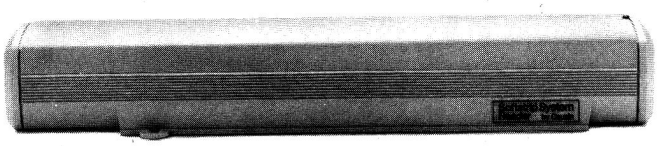
# It's amazing what you can reveal when you strip.

Introducing a shape that's about to turn on an entire industry.

The Softstrip™ data strip. From Cauzin.

This new technology allows text, graphics, and data to be encoded on a strip of paper, then easily entered into your computer using a scanning device called the Cauzin Softstrip™ System Reader.



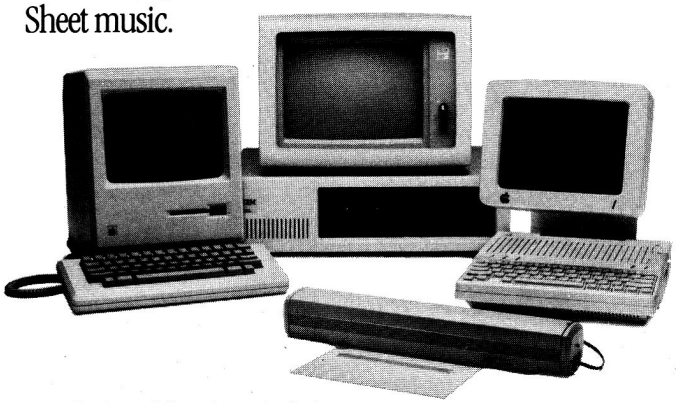
The Cauzin Softstrip System Reader replaces tedious typing by scanning the strip and reading it into your computer.

Creating a simple, reliable and cost efficient way to distribute and retrieve information.

Softstrip data strips, like those you see here, can contain anything that can be put on magnetic disks.

Facts. Figures. Software programs.

Video games. Product demonstrations. Sheet music.



The Cauzin Softstrip System Reader is now compatible with the IBM PC, Apple II and Macintosh.

A single strip can hold up to 5500 bytes of encoded data.

It can stand up to wrinkles, scratches, ink marks, even coffee stains.

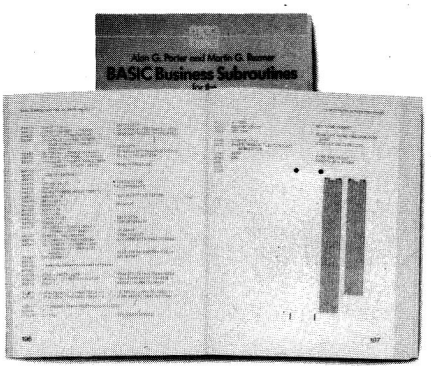
And it can be entered into your computer with a higher degree of reliability than most magnetic media.

Simply by plugging the Cauzin Reader into your serial or cassette port and placing it over the strip.

The reader scans the strip, converts it to computer code, and feeds it into any standard communication interface.

Because strips are so easy to generate, most of your favorite magazines and books will soon be using them in addition to long lists of program code.

And you'll be able to enter programs without typing a single line.




Soon everyone will be stripping as data strips appear in popular magazines, computer books and text books.

There is also software for you to generate your own strips. Letting you send everything from correspondence to business information using our new technology.

Find out how much you can reveal by stripping. Just take this ad to your computer dealer for a demonstration of the Cauzin Softstrip System Reader.

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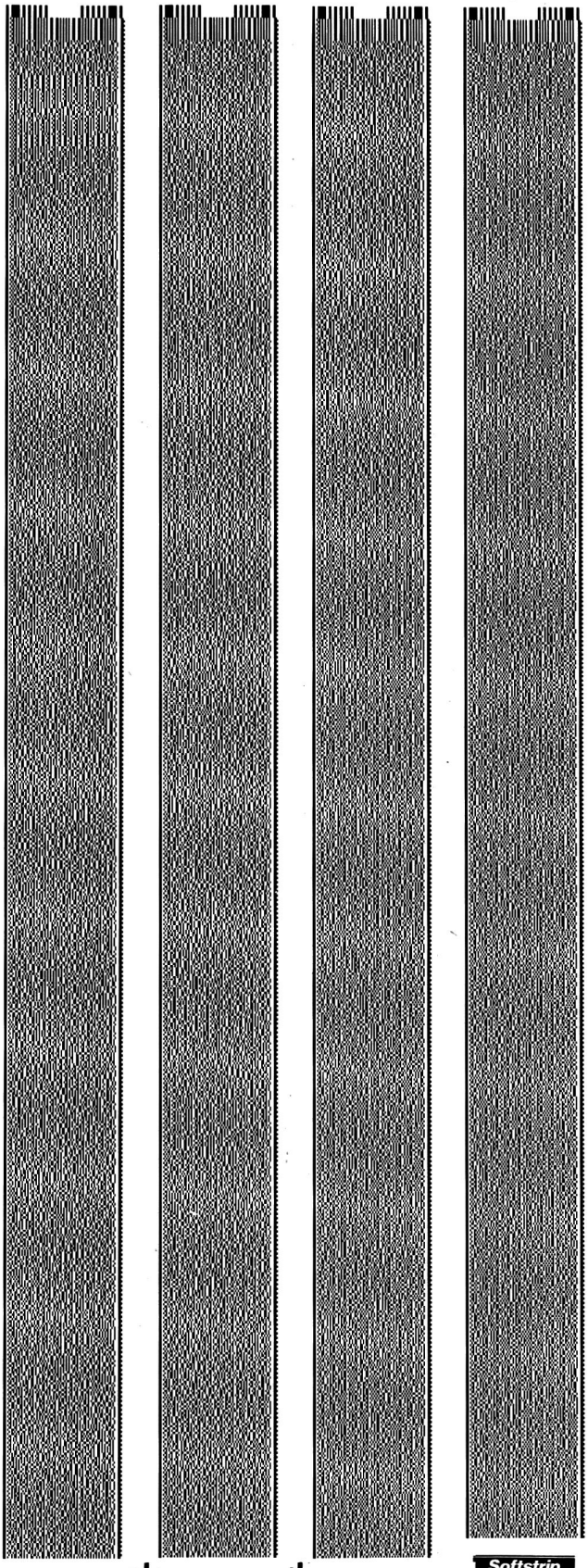
# MAN YOUR BATTLE STATIONS!



An unidentified fleet is on the horizon, heading your way. So, prepare to engage the enemy—via your modem. Here is the hi-tech version of Battleship, an old pencil-and-paper game. It is a game of strategy where you try to find and destroy your opponent's navy before yours is sunk.

These data strips contain MODEM BATTLESHIP, by Kerry Lanz and Bob Ryan, for any Apple II compter and the Hayes Micromodem, Micromodem //e, and Hayes-compatible modems. It is reprinted from *inCider* Magazine, May, 1985.

Read the strips into any Apple II computer following the directions that come with your Cauzin Softstrip™ System reader.

There are three files on these strips. M.BATTLESHIP is the main program written in BASIC. It is compatible with DOS 3.3 and ProDOS. SOUND is a short binary file that provides sound effects for the game. It is loaded automatically when you run M.BATTLESHIP.

MODEM.TEXT is a text file created by Apple Writer that contains the complete original article. It has full documentation for using the program. Most popular word processors (including Apple Writer and AppleWorks) can use it.

*inCider* is a trademark of CW Communications, Inc./Peterborough, NH. Micromodem and Micromodem //e are trademarks of Hayes Microcomputer products.

1 2 3 4

Softstrip

# ASK INCIDER

by Bob Ryan

*If you have a question, Bob Ryan has the answer. Send your queries about Apple computing to Ask* inCider, *80 Pine Street, Peterborough, NH 03458.*

## More on Memory #1

Dear *inCider*:

I'm on the brink of ordering a RamWorks II memory-expansion card for my Apple //e to use with AppleWorks, but I need some specific information.

I need room for about 8000 records in an AppleWorks data base as an index for a magazine I publish. Entries are very short—Reagan, Ronald 45 67 89, for example. In your article on memory-expansion boards ("Thanks for the Memory," December 1985, p. 18), you said RamWorks II can handle 5100 records, but you didn't mention the size of the RamWorks board to which this refers.

What size do I need? If my file exceeds the capacity of my 140K floppies, how do I save the file? You also mentioned in your article that the entire AppleWorks program can be loaded into memory. What's the advantage of this? Does it leave a disk drive free so I can use it for something else? Finally, what do I do with my Apple Extended 80-Column Card after I install a RamWorks II?

**Donna Valley Russell**
**709 East Main Street**
**Middletown, MD 21769**

*Dear Donna:*

*The 5100-record capacity I mentioned for RamWorks does not depend on the amount of memory in your computer—it's a limitation of AppleWorks. (Actually, AppleWorks can handle only 1250 records in one file; the AppleWorks desktop-expansion software that comes with RamWorks II is responsible for the thousands of extra records.) You'll be happy to learn that Applied Engineering has once again (I can't keep up with these guys!) improved its desktop-expansion software, so you can easily fit your 8000 records into a single data-base file (which can now handle more than 13,000 records). Now you have to buy enough memory to ensure that 8000 records of the size you use will fit on your desktop.*

*Your sample record has 23 characters (bytes). I don't know how you've laid out your records or whether any of the fields are numeric, so let's err on the side of caution and say every record will take up about 40 bytes of memory. Multiplying 40 by 8000 gives you 320,000 bytes, or about 312K. In order to get a 312K desktop, you need a 512K RamWorks II board. (Memory-management overhead and AppleWorks itself take up the rest of the available memory.) If you find you need a larger desktop in the future, you can easily expand your RamWorks II board.*

*You don't need to worry about your data-base file exceeding the capacity of your floppies. AppleWorks, as modified by the desktop-expansion software, prompts you to insert a new disk whenever the current one is filled. All you have to do is make sure all the disks on which you save a particular file have the same volume name. In other words, if you're about to save a 312K data-base file, be certain you have three data disks available with the same name (such as /DATABASE). Your file will be segmented on the three disks. The individual files will be called FILENAME, FILENAME.1, and so on. When you want to load a multi-disk file, insert the first disk to which you saved. AppleWorks prompts you when it's time to insert the other disks.*

*Speed is the advantage of loading the entire AppleWorks program into memory. As you know, AppleWorks often has to access the program disk when performing certain functions, like printing or initializing a data disk. If you'd like to eliminate these disk accesses, you have the option, when you install the desktop-expansion software, of having the entire AppleWorks program load into memory whenever you boot the program. Of course, this increases the program start-up time to about two minutes.*

*Loading the entire AppleWorks program into memory also makes it very easy to run it on one-drive systems, though I doubt many people with 256K or larger memory-expansion cards have only one drive. In two-drive systems, the free drive could be used as another data disk or a place to put an AppleWorks accessory program.*

*By the way, if the file on which you're working needs the desktop space used when you load AppleWorks into memory, the parts of AppleWorks that aren't needed in memory will be overwritten. In this case, you'll have to put the AppleWorks program disk back on line.*

*Since RamWorks II does everything your Extended 80-Column Card does (and more), you don't need to hang onto it any longer. If the memory chips on your Extended 80-Column Card ride in sockets, you can remove them and add them to your RamWorks II, to give yourself an extra 64K. If the memory chips are soldered to the Extended 80-Column Card, you might try selling the card.*

## ProDOS COM

Dear *inCider*:

Could you please explain how I can convert a program name to a command under ProDOS? In other words, when I run a program, I want to be able to type "filename" instead of "run filename."

**Zi-chun Lin**
**39-43 59th Street**
**Woodside, NY 11377**

*Dear Lin:*

*I'm afraid ProDOS doesn't support a COM file type, unlike other operating systems such as CP/M and MS-DOS. Without modifying the operating*

*system itself, there's no way to incorporate a file name into the ProDOS command structure.*

*If you just want to save some typing and not bother with file types, you can use the dash (-) command in ProDOS to load and run any executable file.*

## More on Memory #2

Dear *inCider*:

The November 1985 *inCider* carried an announcement of the Apple II RAM Expansion Card (p. 12). I have an Apple II Plus with 48K, which has been adequate for my spreadsheet work. Now I'd like to use a particular income-tax package on my computer, but I don't have enough memory to run it. Will the II RAM Expansion Card increase my computer's memory to 248K? Is the II RAM Expansion Card available? Do you know where I can buy it?

**Hobart P. O'Brien**
**5521 Frederick Drive**
**Cheyenne, WY 82001**

*Dear Hobart:*

*The Apple II Memory Expansion Card (Apple finally settled on this name) is not available at press time (December 1985), and may not be available when this issue hits the newsstand (mid-February 1986). When it's shipped, you'll be able to buy it at any Apple II dealership. The card will come in four sizes (256K, 512K, 768K, and 1 megabyte), so you can choose the amount of memory you want to add.*

*There are two important points you must consider before you buy an Apple II Memory Expansion Card. First, does the software you want to run support the card? That is, is the software designed to recognize the extra memory in your machine and utilize the extra memory it finds? If the software doesn't recognize the card, your investment in the Memory Expansion Card is wasted.*

*Second, the technology behind the Apple II Memory Expansion Card has not been proved. I have yet to see a production model, so you'd better take what I have to say with a grain of salt, but it seems the Memory Expansion Card is best suited as a RAM disk, not a true main-memory expander. Consequently, not only do you have to find out if your software recognizes the Apple II Memory Expansion Card, but also how your software uses the card. Will your software use the card simply as a RAM disk to increase disk-access time, or will it use the card to actually expand the size of your spreadsheets and word-processed documents?*

*Obviously, a number of questions concerning the Apple II Memory Expansion Card can't be answered until production versions are made available to the press and public. Frankly, I grow more skeptical every day about the usefulness of this card, but I'll withhold judgment until all the facts are in.*

## Some Like It Hot

Dear *inCider*:

I recently purchased a *//c* with an external drive and a Hayes Smartmodem 300. The space I have available for my computer system is limited, so I'm forced to put the modem under the external drive.

I've noticed that when I use the modem, it generates some heat. Is this apt to create any hazards for the drive? Will the modem create any RF interference that might harm the drive's operation?

**Mark Frank**
**110 Highland Avenue**
**Staten Island, NY 10301**

*Dear Mark:*

*It's unlikely that the heat your Smartmodem generates will harm your //c external drive. The amount of heat a Smartmodem gives off isn't enough to affect the electronics of the drive. Also, since it's an electronic device, the Smartmodem produces very little RF interference. Most RF problems come from electromechanical devices, like disk drives.*

*This brings up one possibility you didn't mention. The external drive is more likely to interfere with your modem, rather than your modem interfering with your drive. You may possibly lose some data when they're operating at the same time, but unless you actually notice a problem, don't bother changing your current setup.*■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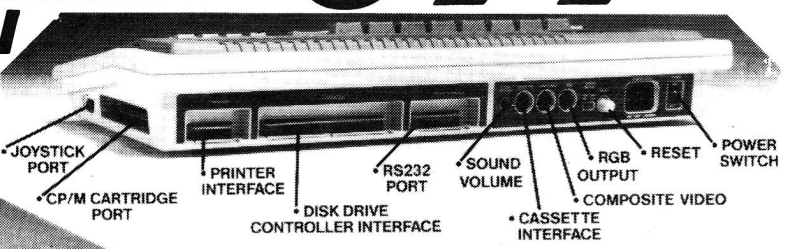


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## SPECIFICATIONS

**A plus 3000** is a complete, self-contained computer based on the popular 6502A microprocessor and can tap into the tremendous software library of Apple II. Features include 192K Bytes RAM, 32KB Enhanced Microsoft BASIC, 80 column text, 560H X 192V color graphic display, 81 key sculptured keyboard and high efficiency switching power supply. Also included as standard are Centronics bus printer interface, Cassette interface, 4 channel sound generator, and 5¼" Apple Compatible Disk Drive.

- **TEXT**
  - — 40 columns X 24 rows or 80 columns X 24 rows software selectable.
  - — 5 X 7 characters in 7 X 8 matrix.
  - — Upper and lower case characters.
  - — One of Eight colors for characters/graphics and background, Red, Green, Blue, Cyan, Magenta, Yellow, Black and White.
  - — Character set with normal, inverse and flashing capabilities.
- **GRAPHICS**
  - — 280H X 192V 6 colors — Black, White, Violet, Green, Blue, Orange.
  - — 280H X 192V 8 colors bit image — Black, White, Red, Green, Blue, Cyan, Magenta, Yellow.
  - — 560H X 192V 6 colors — Black, White, Violet, Green, Blue, Orange. (High resolution color monitor required)

***More Features than Apple® for less than Commodore®***

| Features | Aplus 3000 | Apple IIe | Commodore C-128 |
|---|---|---|---|
| RAM | **192K** | 64K | 128K |
| Runs Apple II Software | **Yes** | Yes | No |
| Function Keys | **24** | None | 16 |
| 4 Voice, 6 Octave Sound | **Yes** | No | Yes |
| Composite Video | **Yes** | Yes | Yes |
| Disk Drive | **included** | Extra Cost | Extra Cost |
| Numeric Keypad | **included** | Extra Cost | Included |
| Video Cable | **included** | Extra Cost | Extra Cost |
| RGB Color Card | **included** | Extra Cost | Included |
| 80 Column Card | **included** | Extra Cost | Included |
| Centronics Printer Interface | **included** | Extra Cost | Extra Cost |
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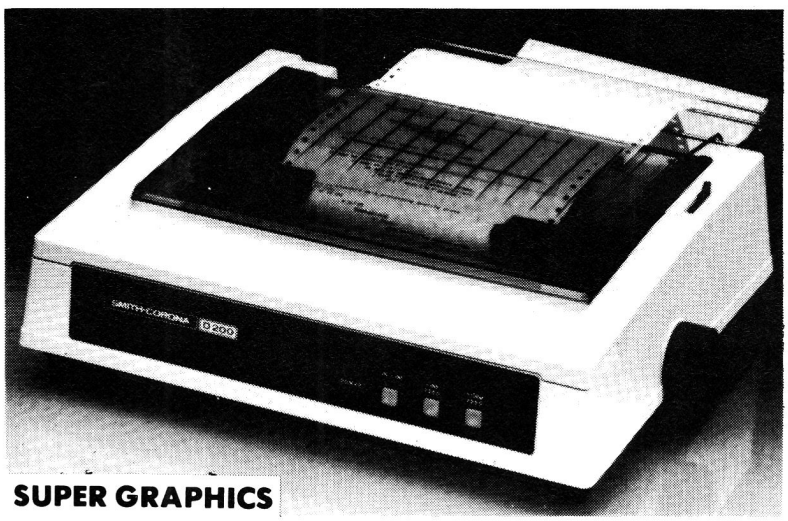

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# APPLESOFT ADVISER

## An Applesoft Bar Builder

by Dan Bishop

The array is one of the most versatile tools available to the BASIC programmer. In February's column (p. 94), I presented an amortization-schedule program that uses three arrays to store each payment's principal, interest, and remaining balance. This month I'll show you how you can use arrays to display data graphically. In most of these cases, you type in the data as a "batch" of values. Bar Builder (see the accompanying **Program listing**) then manipulates these values into graphics parameters, which it uses to define the resulting display. Since the program stores all of the values in an array as you type them in, you can alter individual data elements or the graph parameters after viewing the display, without having to reenter the entire data set.

**Using Applesoft arrays, you can construct multicolored bar graphs on the low-resolution graphics screen.**

### Drawing Bars

Using low-resolution graphics mode to draw horizontal and vertical bars in Applesoft is easy. First issue the GR command, which tells your computer to enter lo-res. Then specify the color you want to use for the line you're drawing. Low-resolution graphics gives you 16 colors from which to choose, numbered zero (black) to 15 (white). For example, type the command COLOR = 2 if you want a dark-blue (2) line.

Now imagine your video screen divided into 40 columns (numbered zero to 39) and 40 rows (also numbered zero to 39). To draw a vertical line in (or "AT") column 20 and extending from row 12 through row 35, use the command VLIN 12,35 AT 20. That's all there is to it!

Applesoft handles horizontal lines the same way. With the AT clause, specify the row in which you want the horizontal line to appear, and specify the starting and ending column numbers immediately following the HLIN. For example, a horizontal line extending across the bottom of the graphics-display screen appears following the command HLIN 0,39 AT 39.

The GR command turns the low-resolution graphics mode on. This display does not fill the entire screen, however. A four-row text window at the bottom of the screen leaves room for typing in titles or labels for your graphics display.

The **Program listing** uses one other graphics command. CALL −1994 clears the low-resolution graphics screen. It works like the HOME command in text mode. And, finally, the command that returns the display to text mode (the opposite of the GR command) is simply the word TEXT.

### The Bar Builder Program

Bar Builder is a short program that displays up to 38 data values as a vertical bar graph, or histogram. The graphics display consists of a dark-blue frame along the edges of the graphics screen. The histogram is centered within this frame. Two colors alternate as the bars forming the histogram. The colors the **Program listing** displays also provide a visual contrast on the Apple's monochrome monitor. You can change them by altering lines 110 and 120.

The program automatically adjusts the width of the individual bars to take advantage of the full 40-column width of the screen. If you type in fewer than 13 values, the bars are three columns wide. Thirteen to 19 values result in bars that are two columns wide, while for 20–38 values, each bar occupies only a single column. Once it determines the width, the program calculates the size of the left- and right-hand margins needed to center the graph. The variables for width (W) and margin (MG) are calculated in lines 3180 through 3230.

You may type in up to three lines of text when you run the program; these three lines appear in the text window below the graphics display. You must type in each line separately when the appropriate prompt appears. If you want to type in a line of text that begins with several blank spaces (for example, to center a title), type a quotation mark as the first character, then enter the spaces. Without the quotation mark, Applesoft will ignore the spaces and left-justify the text.

You can also subtract a "base" amount from each entry. You may need such an option for cases in which the data values are very large and the differences between them are small. The program must reduce each value to a "zero to 37" scale to fit on the graph, while maintaining the closest possible relation to the other values. Suppose you have five data elements: 898, 895, 900, 899, and 905. The program presented here would plot these as five bars of nearly equal height. If you instruct the program to remove 890 from each element, though, the data values it plots will be 8, 5, 10, 9, and 15. The effect is to zoom in on the upper portion of the graph. Just don't forget that you'll be looking at only the "tip of the iceberg."

You can also return to the program after viewing a graph and change one or more of the values you entered—so you can correct entry errors without having to type in the entire data set. One note of caution, though: If you subtracted a value from all data elements as described above, you must add that value back in

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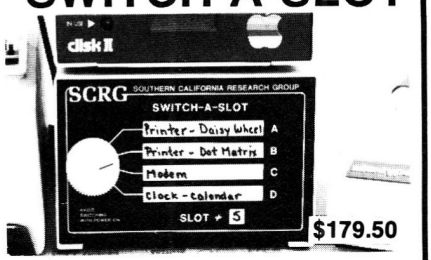


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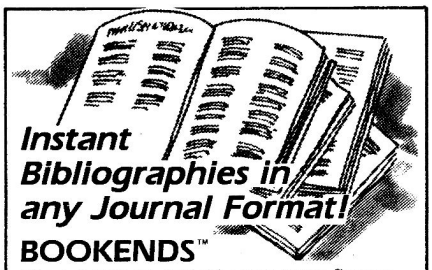

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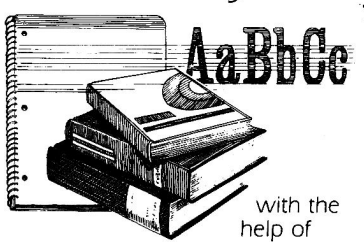


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# APPLESOFT ADVISER

*Program listing.* Bar Builder.

```
5   REM
6   REM  *********************
7   REM     BAR BUILDER
8   REM     MAIN PROGRAM
9   REM  *********************
10   TEXT : HOME : GOSUB 100
20   GOSUB 1000: GOSUB 1200
30   GOSUB 3100: GOSUB 3000: GOSUB 3500
40   INPUT "CONTINUE <C>  OR  END <E>...";X$
50   IF X$ <  > "C" AND X$ <  > "E" THEN 40
60   IF X$ = "E" THEN 90
70   TEXT : HOME : GOSUB 1300
80   GOTO 30
90   TEXT : HOME : END
95   REM
96   REM  *********************
97   REM   VARIABLE INITIALIZATION
98   REM  *********************
99   REM
100   DIM D(40),ND(40),T$(3)
110  C1 = 5
120  C2 = 12
130   FOR I = 0 TO 40
140  D(I) = 0
150   NEXT I
160   RETURN
195   REM
196   REM  ************************
197   REM   INVALID ENTRY RESPONSE
198   REM  ************************
199   REM
200   PRINT : PRINT "INVALID ENTRY.  "
210   INPUT "PRESS <RETURN> TO CONTINUE...";X$
220   RETURN
995   REM
996   REM  ************************
997   REM   GET GRAPH PARAMETERS
998   REM  ************************
999   REM
1000   HOME : PRINT
1010   PRINT "****************************************"
1020   PRINT "  SINGLE DATA SET BAR GRAPH BUILDER"
1030   PRINT "****************************************"
1040   PRINT
1050   PRINT "HOW MANY DATA POINTS (1-38)"
1060   PRINT "DO YOU WISH TO ENTER (0 TO END)...";
1070   INPUT N
1080   IF N < 0 OR N > 38 THEN  GOSUB 200: GOTO 1000
1090   PRINT
1100   FOR T = 1 TO 3
1110   PRINT "ENTER TEXT LINE #"T": "
1120   INPUT "";T$(T)
1130   PRINT
1140   NEXT T
1150   RETURN
1195   REM
1196   REM  ********************
1197   REM   GET DATA ELEMENTS
1198   REM  ********************
1199   REM
1200   PRINT
1210   FOR I = 1 TO N
1220   PRINT "DATA POINT #"I": ";
1230   INPUT "";D(I)
1240   NEXT I
1250   PRINT : PRINT "WHAT COMMON VALUE DO YOU WANT"
1260   PRINT "SUBTRACTED FROM EACH ELEMENT (OR 0)";
1270   INPUT SF
1280   PRINT "THIS VALUE WILL BE STORED IN ELEMENT 0."
```

*Listing continued.*

again (by changing element zero by the negative of the amount you subtracted). Using the example in the previous paragraph, you would elect to change only element zero, make it −890, then cycle back to the graph display. It's now safe to go back and correct any of the other elements, and to change element zero from −890 to 890 again and display the corrected graph.

Since the program automatically alternates colors as it draws the histogram, you can display two sets of related data to illustrate the differences between them. To do this, simply alternate entries. Type in values from the first set for all odd entries, and the corresponding values from the second set for all even entries.

### Normalization of Data

The values you type in for your data may be any positive numbers, ranging from minute decimal fractions (such as 0.0000123) to astronomical figures. To manipulate these entries into values it can display on screen, your computer must convert each value to an integer ranging from zero through 37, and maintain the relative differences between them. This process is called *normalization*, and involves the calculation of some *normalization factor* (NF in the **Program listing**) by which every data element is multiplied.

In this program, the D array contains the original entries, while the ND array contains the normalized values for the histogram display. Lines 3100–3140 calculate the normalization factor, and lines 3150–3170 multiply each value in D by this factor.

The first step in the normalization process is finding the largest value contained in the data set. When the program finds this value, it stores it in D(40). The maximum length of any bar in the histogram is 37, so the program divides 37 by D(40) to arrive at NF. It then multiplies all elements by NF. Thus the program maintains the relative "intensities" of the elements.

Finally, line 3560 actually draws the bar:

```
VLIN 39 - ND(H), 38 AT MG + W *
  (H - 1) + (LW - 1)
```

This line instructs your computer to subtract the normalized value for the element it's currently plotting (element H) from 39 to determine the high point for this particular bar. For example, if ND(H) is 37 (the maximum normalized value), then 39 − 37 = 2. The top of this bar will be at row 2, and it will extend down to row 38, the base line for the graph. On the other hand, if ND(H) is 2, then 39 − 2 = 37. The top of this bar will be at row 37, and the bar will extend down to row 38.

*"Bar Builder generates some rather striking histograms, and is fun to play with."*

In calculating the column for this particular bar, the program adds the value of MG, the left margin, to the number of columns already filled in: H − 1 is the number of elements already covered, and W is the width of each bar. W * (H − 1) represents the number of columns taken up by previous elements. Finally, if the bar width is greater than 1, the program adds the number of columns already drawn for this particular element to MG + W * (H − 1). This accounts for the LW − 1 term in line 3560.

### Conclusion

Bar Builder generates some rather striking histograms, and is fun to play with as well. Although it's designed for a single data set, you can use it with two data sets, since the program alternates between two colors when drawing the graph. For three or four data sets, though, the best form for the histogram consists of overlapping bars with blank columns between groups of bars. Multiple-dimensioned arrays are ideal for handling this type of information. Next month I'll deal with just such a situation; in the meantime, try modifying Bar Builder so that it can handle four sets of data in an overlapping-histogram display.■

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*Listing continued.*

```
1290 D(Ø) = SF: RETURN
1295  REM
1296  REM  *********************
1297  REM   DATA ENTRY CORRECTION
1298  REM  *********************
1300  PRINT "----------------------------------------"
1310  PRINT "DO YOU WISH TO CHANGE ANY DATA ENTRIES?"
1320  INPUT "(Y/N)...";X$
1330  IF X$ <  > "Y" AND X$ <  > "N" THEN  GOSUB 200: GOTO 1300
1340  IF X$ = "N" THEN 1390
1350  INPUT "WHICH ENTRY NUMBER...";EN
1360  PRINT "ENTRY "EN" IS "D(EN)"."
1370  INPUT "WHAT VALUE SHOULD IT HAVE? ";NV
1380 D(EN) = NV: GOTO 1300
1390 SF = D(Ø): RETURN
2995  REM
2996  REM  ******************
2997  REM  BLUE GRAPH BORDER
2998  REM  ******************
2999  REM
3000  GR : CALL  - 1994
3010  COLOR= 2
3020  VLIN Ø,39 AT Ø
3030  VLIN Ø,39 AT 39
3040  HLIN Ø,39 AT Ø
3050  HLIN Ø,39 AT 39
3060  RETURN
3095  REM
3096  REM  ***********************
3097  REM    NORMALIZE DATA INTO ND
3098  REM  ***********************
3099  REM
3100 D(1) = D(1) - D(Ø):D(40) = D(1)
3110  FOR I = 2 TO 38:D(I) = D(I) - D(Ø)
3120  IF D(I) > D(40) THEN D(40) = D(I)
3130  NEXT I
3140 NF = 37 / D(40)
3150  FOR I = 1 TO 38
3160 ND(I) =  INT (D(I) * NF)
3170  NEXT I
3180 W = 1
3190  IF N < 20 THEN W = 2
3200  IF N < 13 THEN W = 3
3210 MG =  INT ((38 - N * W) / 2)
3220  IF MG < 1 THEN MG = 1
3230  RETURN
3495  REM
3496  REM  ***********************
3497  REM    DISPLAY GRAPH
3498  REM  ***********************
3499  REM
3500  HOME
3510 CØ = C1
3520  GOSUB 3000
3530  FOR H = 1 TO N: COLOR= CØ
3540  FOR LW = 1 TO W
3550  IF ND(H) = Ø THEN LW = W: GOTO 3570
3560  VLIN 39 - ND(H),38 AT MG + W * (H - 1) + (LW - 1)
3570  NEXT LW
3580  IF CØ = C1 THEN CØ = C2: GOTO 3600
3590 CØ = C1
3600  NEXT H
3610  HOME
3620  PRINT T$(1)
3630  PRINT T$(2)
3640  PRINT T$(3)
3650  RETURN
```

*End of listing.*

# PASCAL PRIMER

## The Record: Pascal's Pack Rat

by Tom Swan

The record is the pack rat of data types. One of Pascal's most versatile features, it collects and stores just about anything you give it. In this month's column, I'll explain records and show you how to use them to write your own data-base programs (and other types, too).

### Creating Record Variables

To create a record variable, surround a list of field names and data types with the keywords RECORD and END. If you want to write a program to organize a video-tape collection, for example, you could declare each entry a Pascal record as below:

```
VAR
  Entry : RECORD
            TapeNumber  : string[4];
            Title       : string[30];
            Counter     : integer;
            Minutes     : real;
          END;
```

Entry is a record with four *fields*: TapeNumber, Title, Counter, and Minutes. Each field is simply a variable stored within Entry. In this example, two fields are strings, one is an integer, and one is a real number. To tell Pascal to do something with one of these fields, use the record name, a period, and the field name you want. To display the title, for example, you could use the following statement:

```
writeln( Entry.Title );
```

The period, record, and field names form a path to the field in the record. Because fields are variables, you use them as you do any other Pascal variables. As demonstrated below, use readln to let operators directly type values into fields:

```
write( 'Counter value? ' );
readln( Entry.Counter );
```

### WITH Statements

To avoid typing record names over and over, use a WITH statement. An example demonstrates how this

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works. In your video-tape program, you could use a writeln statement to design a procedure that writes a report of the individual fields in Entry records:

```
writeln( Entry.TapeNumber, '  ',
         Entry.Title,
         Entry.Counter:10,
         Entry.Minutes:10:0 );
```

To avoid typing Entry four times, just put a WITH. . .DO statement before the writeln:

```
WITH Entry DO
  writeln( TapeNumber, '  ', Title,
           Counter:10, Minutes:10:0 );
```

The WITH tells Pascal that TapeNumber and the other fields are part of Entry. You can use WITH in single statements as shown above, or in compound constructions. To initialize a new Entry record, you could write:

```
WITH Entry DO
BEGIN
  TapeNumber := '';
  Title := '';
  Counter := 0;
  Minutes := 0
END;
```

When using this type of WITH statement, be careful to avoid conflicts with other variables that have the same names as record fields. **Listing 1** demonstrates this problem. Variable rec is a record with one integer field, i. The program also declares i as a plain integer variable. Although the field and the variable have the same name, they are two different entities.

Line 7 initializes both the field and variable to zero. Because of the WITH statement, however, it's unclear whether line 9 assigns the value 255 to the field or to the variable. But when you run the program, line 10 displays:

```
I=0    REC.I=255
```

proving that, inside WITH statements, record fields take precedence over variables of the same name. Although Apple Pascal works this way, there is no general rule that guarantees similar results in other Pascals. To be completely safe, try to use field names that differ from other program variables.

### Mixing Data Types

Pascal lets you mix data types to create complex variables. You can have records with array fields, arrays of records, or even records of arrays of records—just about anything you can imagine.

One common construction is an array of records. In a data-base program, you can store many records in an array; read and write the array to disk; and search, edit, and list record fields. Having all your records in one

*Listing 1. FieldTest.*

```
 0: PROGRAM FieldTest;
 1: VAR
 2:    rec : RECORD
 3:             i : integer
 4:          END;
 5:    i   : integer;
 6: BEGIN
 7:    rec.i := 0; i := 0;
 8:    WITH rec DO
 9:       i := 255;
10:    writeln( 'I=', i, '  REC.I=', rec.i )
11: END.
```

*Listing 2. WithTest.*

```
 0: PROGRAM WithTest;
 1: TYPE
 2:    rec = RECORD
 3:             a,b,c,d : string[4];
 4:          END;
 5: VAR
 6:    a : ARRAY[ 1 .. 100 ] OF rec;
 7:    i, j : integer;
 8: BEGIN
 9:    page( output );
10:    writeln( 'WITH Statement Benchmark' );
11:    writeln;
12:    write( 'Without WITH.  Press return...' );
13:    readln;
14:    write( chr(7) );
15:    FOR i := 1 TO 100 DO
16:       FOR j := 1 TO 100 DO
17:          BEGIN
18:             a[j].a := 'aaaa';
19:             a[j].b := 'bbbb';
20:             a[j].c := 'cccc';
21:             a[j].d := 'dddd';
22:          END;
23:    write( chr(7) );
24:    writeln( 'Done' );
25:    writeln;
26:    write( 'With WITH.  Press return...' );
27:    readln;
28:    write( chr(7) );
29:    FOR i := 1 TO 100 DO
30:       FOR j := 1 TO 100 DO
```

*Listing continued.*

array—rather than in separate arrays for each field as you would probably do in BASIC—makes data-base programming much easier. Also, in such a program, a WITH statement not only saves typing, but also improves program speed.

**Listing 2** proves this claim with a simple test. The idea is to run a time-test on two nested FOR loops—one that uses a WITH statement and one that doesn't. In this program, rec has four string fields—a, b, c, and d. Line 6 declares an array of 100 of these records, and the FOR loops at lines 15–22 and 29–37 assign strings to record fields, performing a total of 40,000 assignments (100 by 100 by 4).

When I ran the test on an Apple II Plus, I expected a small improvement in the second loop at lines 29–37. The results surpassed my hopes. Without WITH, the assignments took one minute, 15 seconds. Adding WITH reduced that time to 41 seconds, a 45 percent reduction—almost twice as fast!

To see why this works, compare lines 17–22 and 31–37. Apparently,


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reducing the four array indexes to a single-index operation in a WITH statement lets Pascal operate more efficiently. If you use arrays of records, this is a speed-up trick worth remembering.

### Records and the Data Base

In a previous column, you learned how to use Get and Put to read and write data in disk files. With a file of records, you can do the same thing to write simple data-base programs.

**Listing 3**, Articles, keeps track of magazine titles and then searches for specific topics. You can store titles in separate disk files or together in one big file.

When the program starts, it asks you for a file name. If you type an existing name, line 134 resets the file. If it can't find the name you type, it creates a new file in line 139.

Lines 9–16 define record fields. These are my choices, but if you want to add other fields, go ahead. Notice that all fields are strings. I think this makes data-base program-

*Listing continued.*

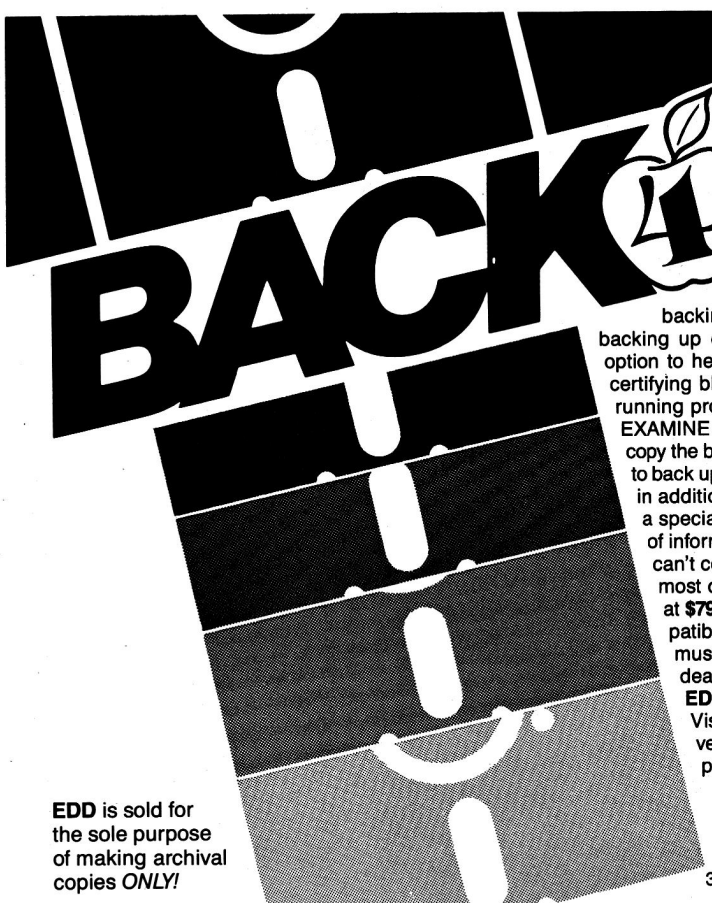
```
31:          WITH a[j] DO
32:             BEGIN
33:                a := 'aaaa';
34:                b := 'bbbb';
35:                c := 'cccc';
36:                d := 'dddd'
37:             END;
38:    write( chr(7) );
39:    writeln( 'Done' )
40: END.
```

*End of listing.*

*Listing 3. Articles.*

```
 0: PROGRAM Articles;
 1: (* Magazine title index program *)
 2: (* (C) 1985 by Tom Swan *)
 3: CONST
 4:    Version = '1.00';
 5:    ClrEol = 29;       (* Clear to end of line *)
 6:    ClrEos = 11;       (* Clear to end of screen *)
 7:
 8: TYPE
 9:    IndexRec = RECORD
10:                  Title : string[ 40 ];
11:                  Author : string[ 30 ];
12:                  Month : string[ 2 ];
13:                  Year : string[ 2 ];
14:                  Page : string[ 3 ];
15:                  Subjects : string[ 64 ]
16:               END;
17:
18: VAR
```

*Listing continued.*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*Listing continued.*

```
19:     Choice : char;
20:     IndexFile : FILE OF IndexRec;
21:     IndexName : string[23];
22:     ChangesMade : Boolean;
23:
24: PROCEDURE Prompt( message : string );
25: BEGIN
26:     gotoxy( 0, 0 );
27:     write( message, chr( ClrEol ) )
28: END; (* Prompt *)
29:
30: PROCEDURE GetChoice( VAR ch : char; message : string );
31: (* Prompt for and return uppercase choice A to Z in ch *)
32: BEGIN
33:     Prompt( message );
34:     REPEAT
35:        read( keyboard, ch );
36:        IF ( ch >= chr(97) ) AND ( ch <= chr(122) )
37:           THEN ch := chr( ord(ch) - 32 );
38:     UNTIL ch in [ ' ', 'A' .. 'Z' ];
39:     writeln( ch )
40: END; (* GetChoice *)
41:
42: PROCEDURE ShowRec( VAR OneRec : IndexRec );
43: BEGIN
44:     writeln;
45:     WITH OneRec DO
46:     BEGIN
47:        writeln( 'TITLE   : ', Title );
48:        writeln( 'AUTHOR  : ', Author );
49:        writeln( 'DATE    : ', Month, '/', Year,
50:                 '    PAGE: ', Page );
```

*Listing continued.*

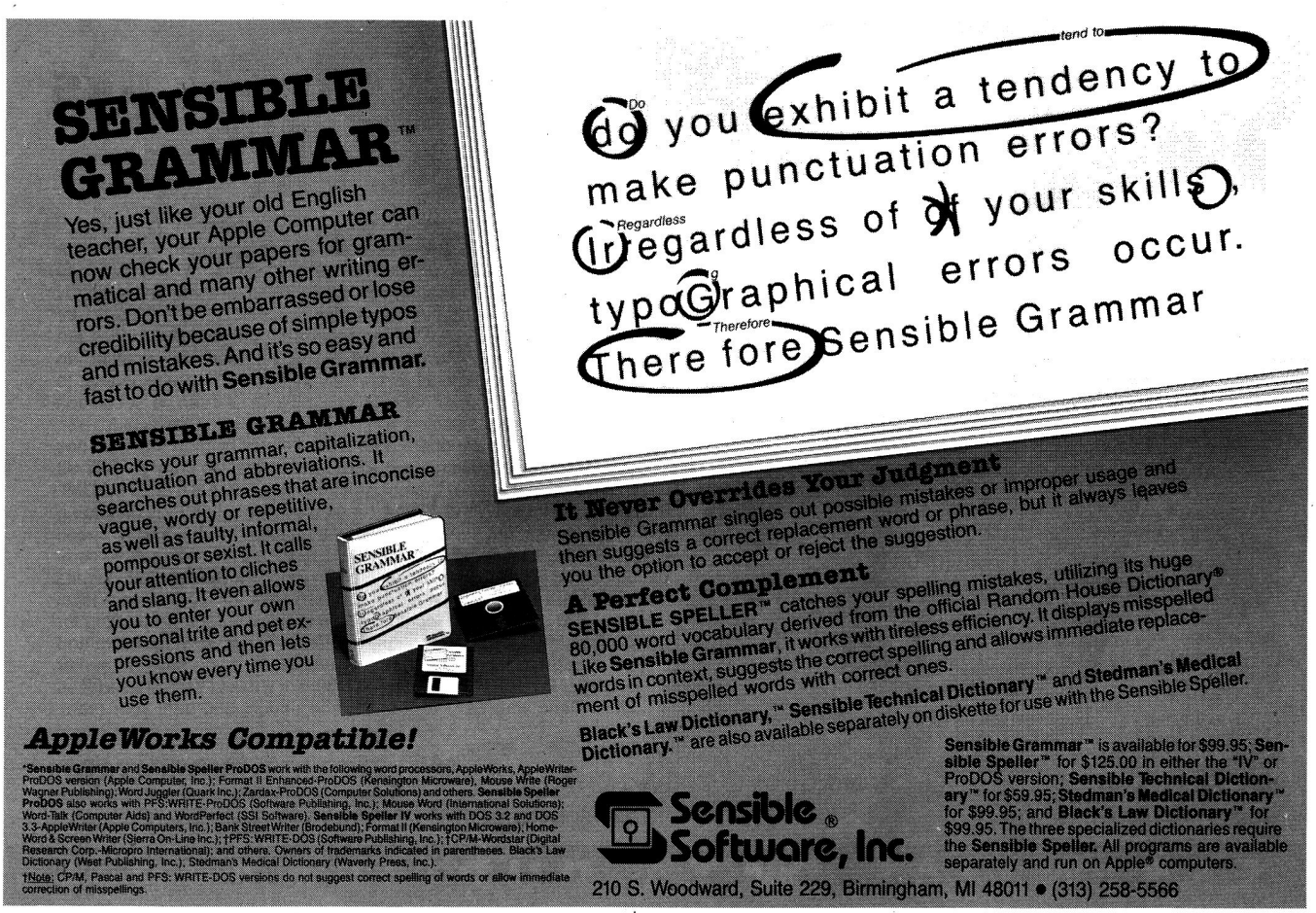
ming easier, but it wastes space. If you declare field Page as an integer, for example, it takes 2 bytes. But, as a string of three characters, it takes 4 bytes, including 1 extra byte for the string length that Pascal adds at the beginning of all strings.

Notice the WITH statement in line 62. The caret after IndexFile tells Pascal to access the file's buffer. The buffer is a variable of the file type, in this case, an IndexRec record. In other words, because of the WITH, in lines 63–70 you enter data directly into the file buffer instead of following the all-too-common, wasteful practice of editing a separate variable and then assigning it to the file buffer.

Articles demonstrates another useful trick that answers a question I often hear. To locate a specific record, line 78 uses Seek, which takes the following form:

```
Seek( f, rn );
```

where f is any typed file and rn is the integer record number. The next Get or Put following Seek reads or writes that record. (The first record in all files

is numbered zero.) As used in the example, however, Seek tries to locate record Maxint, a predeclared constant equal to 32,767. No such record actually exists, of course, so the effect is to find the end of the file and let the Put in line 80 append a new record to those already there.

### Pascal News

There are plenty of goings-on in the world of Apple Pascal. I just returned from the national USUS meeting in Baltimore where I gave a talk on my book, *Pascal Programs for Data Base Management*. USUS, the UCSD Pascal System User's Society, announced that portions of the previously members-only CompuServe MUSUS data base will be open to the public on a trial basis. Type GO MUSUS for details, or write to the Secretary at P.O. Box 1148, La Jolla, CA 92038. You can also leave messages for my ID 70320,260.

Most exciting is the news that Eli Willner and Pecan Software Systems have purchased all assets of SofTech

*Listing continued.*

```
51:       writeln( 'SUBJECTS: ', Subjects )
52:    END
53: END; (* ShowRec *)
54:
55: PROCEDURE AddRec;
56: VAR
57:    Answer : char;
58:    error  : integer;
59: BEGIN
60:    prompt( 'Add new records'
61:    gotoxy( 0, 10 );
62:    WITH IndexFile^ DO
63:    BEGIN
64:       write( 'Title ..... ' ); readln( Title );
65:       write( 'Author ..... ' ); readln( Author );
66:       write( 'Month ..... ' ); readln( Month );
67:       write( 'Year ..... ' ); readln( Year );
68:       write( 'Page ..... ' ); readln( Page );
69:       write( 'Subjects .... ' ); readln( Subjects )
70:    END;
71:    REPEAT
72:       GetChoice( Answer, 'Save new record? ')
73:    UNTIL ( Answer = 'Y' ) OR ( Answer = 'N' );
74:    IF Answer = 'Y' THEN
75:    BEGIN
76:       (*$I-*)
77:       ChangesMade := true;
78:       seek( IndexFile, maxint );  (* Find end of file *)
79:       error := ioresult;          (* Ignore errors *)
80:       put( IndexFile );           (* Save record *)
81:       error := ioresult;          (* Check result *)
82:       IF error <> 0
83:          THEN writeln( 'I/O Error #', error )
```

*Listing continued.*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*Listing continued.*

```
 84:          ELSE writeln( 'Record saved' )
 85:       (*$I+*)
 86:    END
 87: END; (* AddRec *)
 88:
 89: PROCEDURE ListRec;
 90: BEGIN
 91:    prompt( 'List records' );
 92:    writeln;
 93:    reset( IndexFile );
 94:    WHILE NOT eof( IndexFile ) DO
 95:    BEGIN
 96:       ShowRec( IndexFile^ );
 97:       get( IndexFile )
 98:    END
 99: END; (* ListRec *)
100:
101: PROCEDURE SearchRec;
102: VAR
103:    Pattern : string;
104: BEGIN
105:    prompt( 'Search records' );
106:    writeln;
107:    write( 'Subject? ' );
108:    readln( Pattern );
109:    IF length( Pattern ) > 0 THEN
110:    BEGIN
111:       reset( IndexFile );
112:       WHILE NOT eof( IndexFile ) DO
113:       BEGIN
114:          IF ( pos( Pattern, IndexFile^.Subjects ) > 0 ) OR
115:             ( pos( Pattern, IndexFile^.Title    ) > 0 )
116:             THEN ShowRec( IndexFile^ );
117:          get( IndexFile )
118:       END
119:    END
120: END; (* SearchRec *)
121:
122: PROCEDURE Initialize;
123: BEGIN
124:    page( output );
125:    gotoxy( 0, 10 );
126:    writeln( 'Magazine Index ', version );
127:    writeln;
128:    writeln( '(C) 1985 by Tom Swan' );
129:    prompt( 'Index file name? ' );
130:    readln( IndexName );
131:    IF Length( IndexName ) = 0
132:       THEN exit( program );
133:    (*$I-*)
134:    reset( IndexFile, IndexName );
135:    (*$I+*)
136:    IF ioresult <> 0 THEN
137:    BEGIN
138:       writeln( 'NEW FILE' );
139:       rewrite( IndexFile, IndexName )
140:    END;
141:    ChangesMade := false
142: END; (* Initialize *)
143:
144: BEGIN
145:    Initialize;
146:    REPEAT
147:       GetChoice( Choice, 'ARTICLES: A(dd L(ist S(earch Q(uit ' );
148:       write( chr( ClrEos ) );
149:       CASE Choice OF
150:          'A' : AddRec;
151:          'L' : ListRec;
152:          'S' : SearchRec
153:       END;
154:    UNTIL Choice = 'Q';
155:    IF ChangesMade
156:       THEN close( IndexFile, lock )
157: END.
```

*End of listing.*

Microsystems, owners of UCSD Pascal (Apple Pascal's ancestor). Rumors are also floating that Pecan is trying to acquire the ASE editor, an improved SYSTEM.EDITOR sold by the now bankrupt Volition Systems. Also rumored are plans to come out with a competing version of UCSD Pascal for the Apple. Look for drastic price reductions.

All this isn't preventing Apple from releasing version 1.3 of Apple Pascal, however. The new version should be available by the time you read this. According to Apple, it includes support for "a variety of block-structured devices, such as Apple's new 3½-inch disk drive, 5¼-inch disk drives, rigid disk drives, and any other device that follows the ProDOS block device protocol."

Also, the new version boots from slot 4, 5, or 6, and has new data types BYTESTREAM and WORDSTREAM for declaring dynamic arrays, as well as an OTHERWISE clause at the end of CASE statements. The new editor will have "numerous improvements" and will handle files as large as 63 blocks long.

In other notes, an interesting graphics library is available from Giles Asselin, 5734 De Laroche, Montreal, Quebec, Canada H2S 2C6. You need Apple Pascal 1.2 and 128K to use it. Unfortunately, I'm using a 64K Apple II Plus and, therefore, couldn't try it out. The package comes with a disk and a 30-page manual. One small problem is that at times M. Asselin has a little trouble with English. But that's understandable—so do I.

**And Finally. . .**

I'm awaiting my upgrade to Apple Pascal 1.3. Expect a full report soon. Coming up next: sets.■

---

*Tom Swan is the author of the Apple Pascal series,* Pascal Programs for Business, Pascal Programs for Games and Graphics, *and* Pascal Programs for Data Base Management, *published by Hayden Book Company. Address correspondence to Tom at P.O. Box 206, Lititz, PA 17543. Please enclose a self-addressed, stamped envelope if you want a personal reply.*


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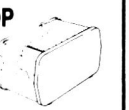

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# GAME ROOM

by Brian J. Murphy

*In Game Room, Brian Murphy tells us what's new in the world of Apple games. Look here for* inCider's *scoop on the latest fun.*

**inCider's Ratings**

| | |
|---|---|
| ★★★★ | Excellent |
| ★★★ | Above average |
| ★★ | Good enough |
| ★ | Not up to standards |
| ☆ | The empty set |

## Ultima IV: Quest of the Avatar

★★★★

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Fantasy/role-playing adventure
Any 64K Apple II, one disk drive, DOS 3.3, second drive optional
$59.95

The new Ultima is here—and it's the ultimate Ultima! Don't think I'm exaggerating. **Ultima IV: Quest of the Avatar** is better than all three of its predecessors. It's been a long time since any game compelled me to play seven hours at a time, as Ultima IV has. It's like a time machine, making the hours slip by at two or three times normal speed.

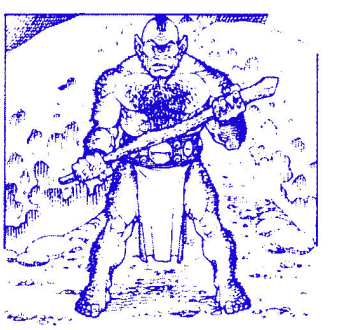
Before you begin playing, the game poses several ethical dilemmas involving such virtues as compassion, spirituality, honor, valor, and justice. None of the problems has an entirely satisfactory answer—each requires difficult moral choices that determine the attributes of the playing character. At the end of the test, a complete adventurer (a true embodiment of the player) emerges into the Ultima universe.

Dungeon fighting and monster killing are incidental to the real object of the game. Rather than the defeat of a wicked arch-wizard, the goal of Ultima IV seems to be the elimination of evil from human hearts and minds, and the cultivation of perfect virtue.

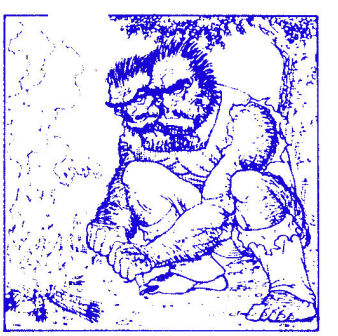
First you must learn how to survive in the Ultima world—find out how to get enough food, learn what areas to avoid for fear of poisoning, and discover which weapons do the most damage to the enemy with the least risk to yourself. Most importantly, you must learn Ultima's delightful system of magic.

In villages, castles, and towns, you'll meet a staggering number of characters, almost all of whom hold the secrets you need to pursue your quest. A few of these folks possess unique information that is absolutely necessary if you expect to make any progress. That's why it's vital to talk with *everyone* you see and to explore *every* nook and cranny of *every* settlement.

I haven't even begun to scratch the surface of this complex game (which is, by the way, 16 times larger than Ultima III). Let me just say that what I like most about Ultima IV is that it de-emphasizes the darker, occult aspects of fantasy games and focuses on spiritual enlightenment and the development of virtue. Ultima IV is a wholesome answer to those uninformed opponents of fantasy games who claim that role



Cyclops



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# GAME ROOM

playing has a destructive effect on the mental health of younger players.

**Short Takes**

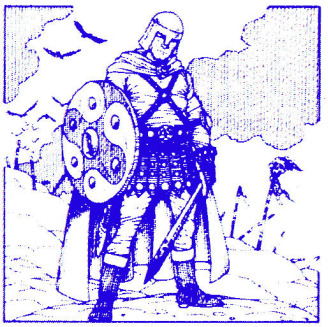
SSI has published two new war games, **Norway 1985** and **Battalion Commander**. I wanted to give Battalion a full trial, but the control system for the joystick is so messed up—at least on my disk—that it's almost impossible to move the cursor in the direction you want. There's no point in wasting any more time on a game that defeats you before you even start to play.

Norway 1985 is the last of the SSI series When Superpowers Collide. It's basically the same old game system, but the action takes place on skis in frozen arctic climes. Although it's a very entertaining game, don't bother with it if you have the other games in the series. The differences in types of terrain and troops aren't compelling enough to complete the set.

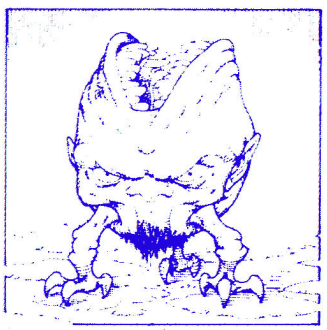
**Shooting from the Lip**

Have you noticed how many new games are ripoffs of older hits? I won't name names, but a number of games in the last year or two have borrowed heavily from Wizardry, the Ultima series, and Archon. Wouldn't it be better to spend the necessary time and effort on imaginative new ideas? On that thought, aloha.■

*Brian Murphy is anxious to learn what you think of the current state of computer games. Write him at* inCider, *80 Pine Street, Peterborough, NH 03458, and let him know your opinion.*

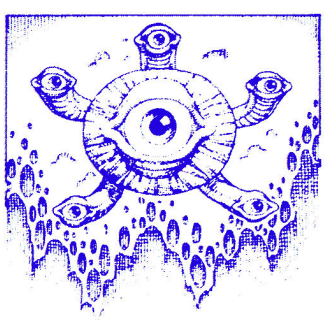


**Fighter**



**Zorn**

**Troll**



**Gazer**



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# APPLE CLINIC

by Jim Sather

*The Apple Clinic is a forum for discussing Apple II hardware and related subjects. If you have questions or answers, or want to make a statement, write to Jim Sather, Apple Clinic,* inCider, *80 Pine Street, Peterborough, NH 03458.*

## More ProDOS on Franklins

I read with great interest your comment in the September 1985 Apple Clinic ("ProDOS on Franklins," p. 66) about patching ProDOS to make it work on a Franklin computer. The bad news is that I used both Apple Mechanic and Locksmith 5.0 to search my entire ProDOS disk for the code you referred to and couldn't find it.

My disk starts to boot and then hangs with the title "ProDOS Version 1.1.1" on the screen. Since mine is a newer version than the one you described, I assume the code I need to change is slightly different. I'd certainly appreciate any advice you could give since I've been unable to find anything helpful in a year's worth of back issues of *inCider*, *Nibble*, and *Byte*.

**George A. Tate**
**Horseheads, NY**

*The patch code in that Apple Clinic response is hard to understand. The changes I was attempting to recommend are $AE $B3 $FB to $A2 $EA $EA and $69 $0B $D0 $03 to $69 $0B $EA $EA. This code is present in the third and fourth blocks of ProDOS 1.1.1. If ProDOS on your disk is located at blocks $7, $9, $A, $B, and so on, then the code is at track/sector-bytes $1/$B-$6 and $1/$9-$9C, respectively.*

*Unfortunately, I overlooked the fact that an additional instance of $AE $B3 $FB occurs in ProDOS version 1.1.1. You can bypass the unwanted occurrence if you search for $AE $B3 $FB $E0 $38 instead of just $AE $B3 $FB. That is, use your disk-scanning utility to search for and change $AE $B3 $FB $E0 $38 to $A2 $EA $EA $E0 $38 and change $69 $0B $D0 $03 to $69 $0B $EA $EA. I hope this will work for past and future versions of ProDOS.*

## ImageWriter Dumps

I bought some public-domain graphics and art disks but don't know how to print the graphics on my ImageWriter. I have an Apple //e. Can you help me?

**Alma T. Lubbers**
**Grinnell, KS**

*You didn't say what kind of printer interface card you have, Alma, and that is important. Some cards (Grappler, Pkaso, Fingerprint, to name a few) have graphics-dumping firmware built in. If your interface card has such drivers, its reference manual will say so and give instructions for generating graphics dumps.*

*Other cards, including the Apple Super Serial card, don't have built-in graphics drivers; you have to load graphics drivers from disk to RAM. With these RAM-based drivers, it's usually best to save the graphics image on disk before running the driver. More specifically, with the image intact in display memory, type BSAVE NAME,A$2000,L$2000 to save a page-1 image, or BSAVE NAME, A$4000,L$2000 to save a page-2 image.*

*The ImageWriter comes with RAM-based graphics drivers on the ImageWriter Tool Kit disk. If you own a Super Serial or compatible card, you can use these drivers to get dumps. Follow the instructions on pages 22–25 of part II of your ImageWriter user's manual. If the Tool Kit drivers don't work with your interface card, general-purpose graphics drivers like Printographer, Graftrix, and Zoom Graphics probably will (see "Visi-Trend/Plot Revisited" in the October 1985 Apple Clinic, p. 60).*

## Z-RAM Tough

I have a question about Z-RAM, the 512K memory-expansion board for the Apple //c. Can you tell me if the heat this board generates poses any risks to the //c? If so, should I restrict the time I operate the computer?

**Ross Fear**
**Baulkham Hills, NSW, Australia**

*Fantastic question, Ross! Unfortunately, I can't give you a simple yes or no answer, but my opinion is that Z-RAM probably won't hurt your //c. This opinion is based on discussions had with engineers from Apple, Applied Engineering (manufacturer of Z-RAM), and Checkmate Technology (manufacturer of the similar, but Z80-less, MultiRam C).*

*Apple's position is that the //c is a closed-lid computer. The company designed it that way and, therefore, doesn't endorse or support any internal additions or modifications. Applied Engineering, however, claims that Apple was very cooperative and of great assistance during Z-RAM development, and my contact at Apple was willing to give me the specifications of the //c power supply (see* ***Table 1****). The people from Applied Engineering told me that Apple had also given them the power-supply specifications, and that Z-RAM draws only 180 milliamps on the 5-volt line and doesn't overload the power supply.*

*Rather than power-supply loading, Apple engineers' primary concern is*

***Table 1.*** *Apple //c power-supply performance.*

| Voltage | Design Capacity | Actual Load |
|---|---|---|
| +5 volts | 1.5 amp | 1.1 amp |
| +12 volts | .9 amp | .6 amp |
| −12 volts | .2 amp | .11 amp |

*the effect internal additions to the //c have on ambient air temperature inside the cabinet. The problem is that floppy-disk jackets can withstand temperatures only up to 52° C, as opposed to the 70° C of commercial ICs. Above 52° C, the jackets begin to soften and deform. The air in an unmodified //c propped up on its handle is about 15° C above room temperature, so the computer becomes a marginally safe environment for floppy disks when room temperature is about 37° C (98.6° F).*

*The information the folks at Applied Engineering sent me stated that they operated a Z-RAM-equipped //c in a 110° F test chamber for two weeks with no heat-related failures. They didn't say whether they used a floppy disk, or, if they did, if it was undamaged. Nor did they state the effect the installation of Z-RAM has on the //c's internal temperature.*

*The designer of Checkmate Technology's MultiRam C told me that MultiRam C caused a temperature rise of no more than 1° C in the //c. Z-RAM may perform similarly, but I wasn't specifically informed that it does. Since I haven't measured the temperatures and current loads myself, I can only report what I've been able to find out from discussions with the manufacturers concerned.*

*I interpret all this information to mean that it isn't safe to leave a floppy disk in a //c operating at a very high room temperature. Addition of internal-expansion RAM and microprocessors cannot help but increase the internal temperature, but I doubt that the additions pose any danger when room temperature is normal. Both Applied Engineering and Checkmate Technology claim tens of thousands of units shipped without any reported bugs, and I believe them. Operate your //c with the handle down, and be wary of hot rooms—Z-RAM or no Z-RAM.*

## Apple //e Jacks

One day when my //e was on the fritz, I examined the motherboard very closely. I found several male jacks labeled J8 to J19, but couldn't find J14. What are J12, J19, and J14 (if it exists) used for, and what are their addresses? Will they help me determine if the reset key is being pressed without the control key, or can I hook J19 up to a burglar alarm and check to see if someone has tripped it?

**Rohan Mahy**
**Oberlin, OH**

*J14 is there, Rohan—it's the power-supply connector. J12 is the video post. You can connect the Apple video signal to a peripheral by attaching a jumper from the peripheral to the video post.*

*J19 is the ENVID/character-set-switch jack. You can connect an open/close mechanical switch to J19 and manually switch functions related to video and keyboard. In the PAL (European) Apple, the switch at J19 selects the standard- or alternate-screen text-character set and keyboard layout. In the NTSC (American) Apple, the switch at J19 selects the standard- or alternate-keyboard layout, but turns off the Apple video signal when you select the alternate-keyboard layout. You can then inject alternate negative-polarity video to the motherboard through auxiliary-slot pin 27.*

*Disabling video while switching be-*

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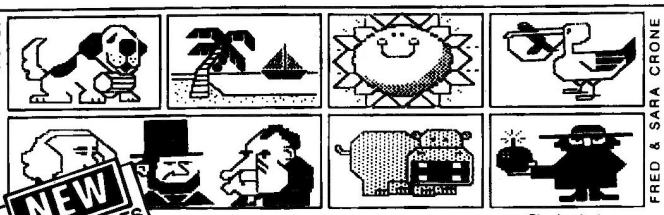


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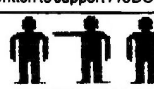

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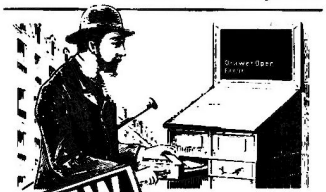

NEW

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```
1 HOME: INVERSE: PRINT CHR$(21)
2 X=RND(1)*24+1: VTAB X: HTAB X:
  PRINT X;: HTAB 26-X: PRINT X;: GOTO 2
```

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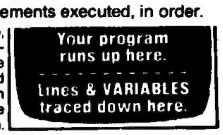


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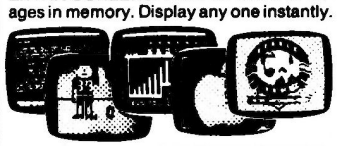

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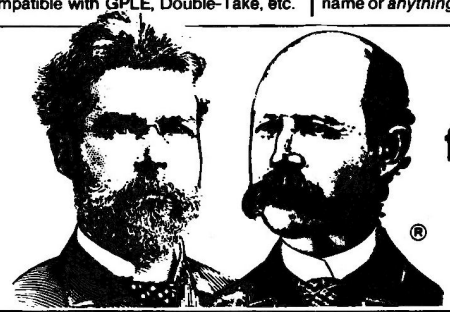

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*tween standard- and alternate-keyboard layouts with a mechanical switch is not particularly useful, so NTSC Apples with switches connected to J19 are rare. On the other hand, switching between alternate-keyboard layouts and video sets is a highly desirable feature, and virtually all PAL motherboards have a switch connected to J19.*

*The only jacks in the Apple with addressable functions are the peripheral slots, the cassette I/O jacks, the 16-pin game I/O socket, and the 9-pin game-socket extension port. (**Table 2** shows all the //e connectors and their functions.) Functions such as monitoring burglar alarms would probably be performed via the switch or timer (paddle) inputs to the game I/O socket or via a peripheral card. The reset key cannot be monitored, as such, by a program. Pressing control-reset brings the RESET' line low and triggers the reset functions of the 6502 and other motherboard and peripheral-card circuits.*

*Table 2. Apple //e connector functions.*

| Connector | Function |
|---|---|
| J1–J7 | Peripheral slots |
| J8 | 9-pin game I/O extension |
| J9 | Cassette in jack |
| J10 | Cassette out jack |
| J11 | Video out jack |
| J12 | Video out post |
| J13 | 4-pin video connector |
| J14 | Power-supply connector |
| J15 | 16-pin game I/O socket |
| J16 | Numeric keypad connector |
| J17 | Keyboard connector |
| J18 | Speaker |
| J19 | ENVID/character-set switch |
| J20 | Power-supply solder pads |

*Incidentally, it is possible to configure your //e keyboard so you don't have to press the control key along with the reset key. I recommend doing this since the location and shape of the //e reset key make accidental resets unlikely. To reconfigure the keyboard, unplug the //e, remove the motherboard from the white case, and remove the keyboard from the motherboard. On the bottom of the keyboard, you'll see a normally closed jumper pad and a normally open jumper pad. Solder the normally open jumper and cut the normally closed one to make the control key unnecessary for a reset.*■


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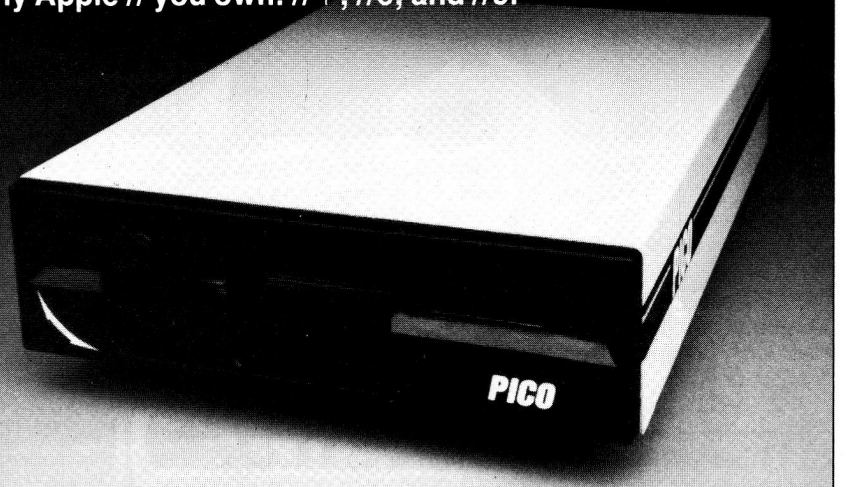


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## WPL Maillist Enhancements

*by John Uzzolino*

Using your computer for multiple mailings is a terrific convenience. Apple Writer //e WPL (Word Processing Language) lets you merge text and address files to create any type of correspondence. I've used the program many times and have found that it lacks a number of features, though. Some simple modifications can improve its performance.

Let's look at the original Maillist program. To merge files, first press the control and P keys. Following the [P]rint/Program prompt, type in "do maillist." Press the return key, and the screen displays "Name and location of Formletter." Type in your text-file name and press the return key. After the "Name and location of Address File" prompt, type in your address-file name, press the return key, and insert your data disk. If you misspell any file name while running this program, you have to repeat the entire procedure.

If you include a number of alterations, the Maillist program will display the following prompts (after you type in "do maillist"):

Name and location of Formletter
(? CATALOG):
Name and location of Address File
(? CATALOG):
Formletter File:
Address File:
CORRECT? (Y/N):
Do you want a file copy? (Y/N)

*Listing 1. Enhanced Apple Writer //e WPL Maillist program, with modifications highlighted.*

```
START PND
 PSX 1
 PPR
 PPR
 PPR                    MAIL LIST FORM LETTERS
 PPR
NAME PPR
 PPR    Name and location of Formletter (?=CATALOG)
 PIN       (example: mlmletter,d2):        :=$B
 PCS /$B//
 PGO NAME
 PCS /$B/?/
 OA
 P
 P
 P
 PCS /$B/?/
 PGO NAME
 PPR
ADDR PPR
 PPR    Name and location of Address File (?=CATALOG)
 PIN       (example: new customers,d2):    :=$D
 PCS /$D//
 PGO ADDR
 PCS /$D/?/
 OA
 P
 P
 P
 PCS /$D/?/
 PGO ADDR
 PPR
 PPR
 PPR            Formletter File: $B
 PPR               Address File: $D
 PPR
 PIN            Correct? (Y/N) :=$C
 PCS /$C/N/
 PGO START
 PCS /$C/n/
 PGO START
 PCS /$C/Y/
 PGO FILECOPY
 PCS /$C/y/
 PGO FILECOPY
 PGO START
FILECOPY PPR
 PIN    Do you want a file copy? (Y/N)   =$C
 PCS /$C//
 PGO FILECOPY
 PPR
 PPR    Insert your data disks.
 PPR
 PIN    To continue, press RETURN.
Ll NY
 L $B
 f<<>.EPØ><
 Y?
 E
 L $D*<(X)>*<*
```

*Listing continued.*

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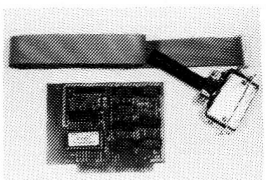

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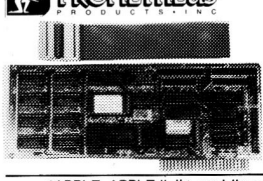

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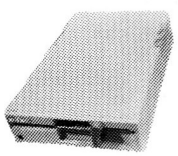

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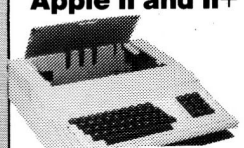

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****When using CP/M, the JE860 and JE868 will only function with Version 2.20 or earlier; PASCAL (JE868) Version 1.1 or earlier.**

Circle 123 on Reader Service Card.

*Listing continued.*

```
PGO L2
NY
PIN Form Letters completed.
Press RETURN.
PQT
L2 B
PLS#*@1@*,*N=$A
B
F/(category1)/$A/A
P
PLS#*@2@*,*N=$A
B
F/(category2)/$A/A
P
PLS#*@3@*,*N=$A
B
F/(category3)/$A/A
P
PLS#*@4@*,*N=$A
B
F/(category4)/$A/A
P
PLS#*@5@*,*N=$A
B
F/(category5)/$A/A
P
PLS#*@6@*,*N=$A
B
F/(category6)/$A/A
P
PLS#*@7@*,*N=$A
B
F/(category7)/$A/A
P
PLS#*@8@*,*N=$A
B
F/(category8)/$A/A
P
PLS#*@9@*,*N=$A
B
F/(category9)/$A/A
P
PLS#*@10@*,*N=$A
B
F/(category10)/$A/A
P
PLS#*@11@*,*N=$A
B
F/(category11)/$A/A
P
PLS#*@12@*,*N=$A
B
F/(category12)/$A/A
P
PLS#*@13@*,*N=$A
B
F/(category13)/$A/A
P
PLS#*@14@*,*N=$A
B
F/(category14)/$A/A
P
PLS#*@15@*,*N=$A
B
F/(category15)/$A/A
P
L8 E
F<.EP0<.EP0<
Y?
D
F<?<<A
P
PNP
PCS /$C/Y/
PNP
PCS /$C/y/
PNP
PSX +1
PGO L1
```

*End of listing.*

If you answer no to the file-copy prompt, the next instruction will be "Insert your data disk." Do this, then press the return key to continue.

This procedure enhances Apple Writer //e WPL Maillist in three ways. The prompt ? CATALOG lets you review your disk directory to select the correct form-letter name, then returns to your location in the program. You don't have to type "do maillist" again. The same holds true for your address file.

Another plus is your ability to review both file names before continuing. If you make a mistake, type N to return to the beginning of the program and start over. You don't have to retype "do maillist" here, either.

The third modification is the option to obtain a printout for your files—just answer yes to the prompt "Do you want a file copy?"

**Listing 1** shows the enhanced WPL Maillist program. Save it to drive 2 with whatever file name you choose. (Make sure you don't save it to drive 1, because you'll erase the original Maillist program.) A little tinkering can make mass mailings with Apple Writer WPL easier than ever. ■

*Write to John Uzzolino at 2237 New York Avenue, Scotch Plains, NJ 07090.*


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## Apple II Multiprogramming

*by Virgelio V. Carpio*

Three BASIC programs in your Apple's memory at the same time—what do you do with them? Why would you need them all?

The term coined by mainframe gurus for running several programs in memory is multiprogramming. The utility presented here (see **Listing 2**) divides your Apple's memory into areas called partitions, where separate programs can reside.

When you work with multiprogramming, you can run each program without affecting the others and their variables. Or you can copy lines from one program to another. A third way to use multiprogramming is to load the program you're editing, write another program to try out a sequence of code, then append the second program to the first when you've ironed out all the bugs. As in the mainframe environment, where you can use one partition for development and another for production, Multiprogrammer offers you the flexibility to test programming techniques before actually incorporating them into your code. You can also use the third partition as a common data area shared by the first two partitions.

Although copying and appending lines are not particularly straightforward programming procedures, Multiprogrammer lets you do away with writing EXECed files, a rather unfriendly method.

### Multiprogrammer in Operation

When you first BRUN Multiprogrammer, it initializes your Apple's memory and sets up three partitions, numbered 1, 2, and 3, while retaining whatever BASIC program you have in memory (if any). To switch from one partition to another, type &n, where n is the partition number. You must type the command NEW in partitions 2 and 3 before actually using them. I suggest that you type &2, NEW, &3, and NEW immediately after you BRUN the program. (To save precious memory, issuing the NEW command in partitions 2 and 3 is not automated.) You can then write, load, run, and save in any of the available partitions.

To copy program lines from one partition to another, list them, then enter the partition in which you want them repeated. The listed lines are still on screen, and you can "retype" them by running the cursor over them.

*Listing 2. Multiprogrammer.*

```
0800                1           TTL "MULTIPROGRAMMER V1.0"
0300                2  MAIN     EQU $300
0800                3  OBJECT   EQU $800
9000                4  ACTUAL   EQU $9000
9000                5           ORG ACTUAL
9000                6           OBJ OBJECT
0019                7  ACTIVE   EPZ $19             ;ACTIVE PARTITION NUMBER
001A                8  SAVEPTR  EPZ $1A             ;SAVE AREA POINTER
0024                9  CH       EPZ $24             ;HORIZONTAL TAB
0025               10  CV       EPZ $25             ;VERTICAL TAB
003C               11  A1L      EPZ $3C             ;MONITOR WORK FOR "MOVE"
003E               12  A2L      EPZ $3E
0042               13  A4L      EPZ $42
0031               14  N1       EQU $31             ;C'1'
0032               15  N2       EQU $32             ;C'2'
0033               16  N3       EQU $33             ;C'3'
0067               17  BASIC    EPZ $67             ;BASIC POINTERS
00AF               18  PROGEND  EPZ $AF             ;BASIC PROGRAM END POINTER
0200               19  KEYBUFF  EQU $200            ;KEYBOARD BUFFER
0800               20  PADDR1   EQU $800            ;PARTITION 1 ADDRESS
3800               21  PADDR2   EQU $3800           ;PARTITION 2 ADDRESS
6800               22  PADDR3   EQU $6800           ;PARTITION 3 ADDRESS
9000               23           ********************************
9000               24           *     MONITOR SUBROUTINES      *
9000               25           ********************************
E003               26  WARM     EQU $E003           ;WARM START
03D9               27  RWTS     EQU $3D9
03F5               28  AMPER    EQU $3F5            ;& VECTOR ADDRESS
FDED               29  COUT     EQU $FDED           ;OUTPUT A CHAR
FD8E               30  CROUT    EQU $FD8E           ;GENERATE A RETURN
FF3A               31  BELL     EQU $FF3A           ;BELL
FD6A               32  GETLN    EQU $FD6A           ;GET INPUT LINE W/ PROMPT
FF2D               33  PRERR    EQU $FF2D           ;PRINT "ERR"
FF4A               34  IOSAVE   EQU $FF4A           ;SAVE ALL REGISTERS
FF3F               35  IOREST   EQU $FF3F           ;RESTORE ALL REGISTERS
FE2C               36  MOVE     EQU $FE2C           ;LONG MOVE
9000               37           ******************************************************
9000               38           *                                                    *
9000               39           *                  MULTIPROGRAMMER                   *
9000               40           *                                                    *
9000               41           *               WRITTEN BY V. CARPIO                 *
9000               42           *         COPYRIGHT 1986 BY INCIDER MAGAZINE         *
9000               43           *                                                    *
9000               44           ******************************************************
9000               45           ;
9000               46  START:
9000               47           *
9000               48           *-------- INITIALIZE ACTIVE PARTITION POINTER
9000               49           *
9000               50  INIT:
9000 A9 31         51           LDA #N1
9002 85 19         52           STA ACTIVE
9004 A9 FF         53           LDA #$FF
9006 85 6F         54           STA BASIC+8
9008 85 73         55           STA BASIC+12
900A A9 37         56           LDA #$37
900C 85 70         57           STA BASIC+9
900E 85 74         58           STA BASIC+13
9010 A9 00         59           LDA #SAVE1          ;SET & VECTOR
9012 8D F6 03      60           STA AMPER+1         ;TO START OF
9015 A9 03         61           LDA /SAVE1          ;THIS PROGRAM
9017 8D F7 03      62           STA AMPER+2
901A A9 4C         63           LDA #$4C            ;PUT A JUMP INSTRUCTION
901C 8D F5 03      64           STA AMPER
901F               65  *
901F               66  *------------ RELOCATE MAIN LOGIC TO $300
901F               67  *
901F A9 3F         68           LDA #RELOC          ;POINT TO START OF DATA
9021 85 3C         69           STA A1L             ;TO BE RELOCATED
9023 A9 90         70           LDA /RELOC
9025 85 3D         71           STA A1L+1
9027 A9 0B         72           LDA #END            ;POINT TO END OF DATA
9029 85 3E         73           STA A2L             ;TO BE RELOCATED
902B A9 91         74           LDA /END
902D 85 3F         75           STA A2L+1
902F A9 00         76           LDA #MAIN           ;POINT TO RELOCATION AREA
9031 85 42         77           STA A4L
9033 A9 03         78           LDA /MAIN
9035 85 43         79           STA A4L+1
9037 A0 00         80           LDY #0
9039 20 2C FE      81           JSR MOVE            ;CALL MOVE ROUTINE TO RELOCATE
903C 4C 03 E0      82           JMP WARM            ;EXIT TO BASIC
903F               83  RELOC:
0300               84           ORG MAIN
0300               85           OBJ OBJECT+RELOC-ACTUAL
0300               86  SAVE1:
0300 A5 19         87           LDA ACTIVE
0302 C9 31         88           CMP #N1             ;PARTITION 1?
0304 D0 0B         89           BNE SAVE2           ;NO, SEE IF P2
0306 A9 03         90           LDA /P1             ;POINT TO PARTITION 1 SAVE AREA
0308 85 1B         91           STA SAVEPTR+1
```

*Listing continued.*

```
030A A9 9C        92            LDA #P1
030C 85 1A        93            STA SAVEPTR
030E 4C 28 03     94            JMP SAVEPART        ;GO SAVE PARTITION
0311              95 SAVE2:
0311 C9 32        96            CMP #N2             ;PARTITION 2?
0313 D0 0B        97            BNE SAVE3           ;NO, CHECK IF P3
0315 A9 03        98            LDA /P2             ;POINT TO PARTITION 2 SAVE AREA
0317 85 1B        99            STA SAVEPTR+1
0319 A9 AC       100            LDA #P2
031B 85 1A       101            STA SAVEPTR
031D 4C 28 03    102            JMP SAVEPART        ;GO SAVE PARTITION
0320             103 SAVE3:
0320             104 *
0320             105 *------------ THE FOLLOWING 4 LINES ARE DELETED TO FIT THE
0320             106 *------------ PROGRAM IN $300-$3D0 RANGE
0320             107 *
0320             108 *          CMP #N3
0320             109 *          BEQ OKAY
0320             110 *          JMP PRERR
0320             111 * OKAY:
0320 A9 03       112            LDA /P3             ;POINT TO PARTITION 3
0322 85 1B       113            STA SAVEPTR+1
0324 A9 BC       114            LDA #P3
0326 85 1A       115            STA SAVEPTR
0328             116 *
0328             117 * ------------ SAVE ACTIVE PARTITION'S POINTERS
0328             118 *
0328             119 SAVEPART:
0328 A0 00       120            LDY #0
032A             121 SAVLOOP:
032A B9 67 00    122            LDA BASIC,Y
032D 91 1A       123            STA (SAVEPTR),Y     ;SAVE
032F C8          124            INY
0330 C0 0E       125            CPY #14
0332 D0 F6       126            BNE SAVLOOP
0334 A5 AF       127            LDA PROGEND         ;ALSO SAVE PROGRAM END POINTER
0336 91 1A       128            STA (SAVEPTR),Y
0338 C8          129            INY
0339 A5 B0       130            LDA PROGEND+1
033B 91 1A       131            STA (SAVEPTR),Y
033D             132 *
033D             133 * ------------ GET NEW PARTITION NUMBER
033D             134 *
033D             135 READ:
033D AD 01 02    136            LDA KEYBUFF+1       ;GET REQUESTED PARTITION NO.
0340 C9 31       137            CMP #N1             ;PARTITION 1?
0342 D0 12       138            BNE PART2           ;NO, SEE IF P2
0344 85 19       139            STA ACTIVE
0346 A9 00       140            LDA #$0
0348 8D 00 08    141            STA PADDR1
034B A9 03       142            LDA /P1             ;POINT TO PARTITION 1 SAVE AREA
034D 85 1B       143            STA SAVEPTR+1
034F A9 9C       144            LDA #P1
0351 85 1A       145            STA SAVEPTR
0353 4C 82 03    146            JMP SETPART         ;GO INVOKE NEW PARTITION
0356             147 PART2:
0356 C9 32       148            CMP #N2             ;PARTITION 2?
0358 D0 12       149            BNE PART3           ;NO, SEE IF P3
035A 85 19       150            STA ACTIVE
035C A9 00       151            LDA #$0
035E 8D 00 38    152            STA PADDR2
0361 A9 03       153            LDA /P2             ;YES, POINT TO PARTITION 2
0363 85 1B       154            STA SAVEPTR+1       ;SAVE AREA
0365 A9 AC       155            LDA #P2
0367 85 1A       156            STA SAVEPTR
0369 4C 82 03    157            JMP SETPART         ;GO INVOKE NEW PARTITION
036C             158 PART3:
036C C9 33       159            CMP #N3             ;PARTITION 3?
036E F0 03       160            BEQ GLOOK           ;YES, CONTINUE
0370 4C 2D FF    161            JMP PRERR           ;NO, SOUND ALARM
0373             162 GLOOK:
0373 85 19       163            STA ACTIVE
0375 A9 00       164            LDA #$0
0377 8D 00 68    165            STA PADDR3
037A A9 03       166            LDA /P3             ;POINT TO PARTITION 3 SAVE AREA
037C 85 1B       167            STA SAVEPTR+1
037E A9 BC       168            LDA #P3
0380 85 1A       169            STA SAVEPTR
0382             170 SETPART:
0382 A0 00       171            LDY #0
0384             172 SETLOOP:
0384 B1 1A       173            LDA (SAVEPTR),Y     ;RESTORE PARTITION POINTERS
0386 99 67 00    174            STA BASIC,Y
0389 C8          175            INY
038A C0 0E       176            CPY #14
038C D0 F6       177            BNE SETLOOP
038E B1 1A       178            LDA (SAVEPTR),Y
0390 85 AF       179            STA PROGEND
0392 C8          180            INY
0393 B1 1A       181            LDA (SAVEPTR),Y
0395 85 B0       182            STA PROGEND+1
0397             183 RETURN:
0397 68          184            PLA
```

*Listing continued.*


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*Listing continued.*

```
0398 68          185           PLA
0399 4C 03 E0    186           JMP WARM            ;EXIT
039C             187 *
039C             188 * ------------ PARTITION 1
039C             189 *
039C             190 P1:
039C 01 08       191 BEG1      ADR PADDR1+1
039E 04 08       192 LOMEM1    ADR PADDR1+4
03A0 04 08       193 NUM1      ADR PADDR1+4
03A2 04 08       194 ARR1      ADR PADDR1+4
03A4 FF 37       195 STR1      ADR PADDR2-1
03A6 01 02       196           HEX 0102
03A8 FF 37       197 HIMEM1    ADR PADDR2-1
03AA 00 00       198 PROGEND1  ADR $0000
03AC             199 *
03AC             200 * ------------ PARTITION 2
03AC             201 *
03AC             202 P2:
03AC 01 38       203 BEG2      ADR PADDR2+1
03AE 04 38       204 LOMEM2    ADR PADDR2+4
03B0 04 38       205 NUM2      ADR PADDR2+4
03B2 04 38       206 ARR2      ADR PADDR2+4
03B4 FF 67       207 STR2      ADR PADDR3-1
03B6 01 02       208           HEX 0102
03B8 FF 67       209 HIMEM2    ADR PADDR3-1
03BA 00 00       210 PROGEND2  ADR $0000
03BC             211 *
03BC             212 * ------------ PARTITION 3
03BC             213 *
03BC             214 P3:
03BC 01 68       215 BEG3      ADR PADDR3+1
03BE 04 68       216 LOMEM3    ADR PADDR3+4
03C0 04 68       217 NUM3      ADR PADDR3+4
03C2 04 68       218 ARR3      ADR PADDR3+4
03C4 FF 94       219 STR3      ADR $94FF
03C6 01 02       220           HEX 0102
03C8 FF 94       221 HIMEM3    ADR $94FF
03CA 00 00       222 PROGEND3  ADR $0000
910B             223 END       EQU *+RELOC-MAIN
03CC             224           END
```

*End of listing.*


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**A/D SPECIFICATIONS**

- 0.3% accuracy
- On-board memory
- Fast conversion (.078 MS per channel)
- A/D process totally transparent to Apple (looks like memory)
- User programmable input ranges are 0 to 10 volts, 0 to 5, −5 to +5, −2.5 to +2.5, −5 to 0, −10 to 0.

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- Fast conversion (.003 MS per channel)
- User programmable output ranges are 0 to 5 volts and 0 to 10 volts

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# EDITORS' CHOICE

## MouseDesk, MouseWord, MouseCalc, MouseBudget

*Every month, hardware and software manufacturers release dozens of new products into the Apple II market. Editors' Choice singles out one product each month that the* inCider *editors feel is a significant addition to the Apple II family of products. Products evaluated in Editors' Choice are among the most recent releases and may not be available yet for retail distribution.*

Are you one of the thousands of Apple users who dream of mice and icons and pull-down menus filling the screen of your II? It's no dream: Version Soft's Mouse-series software will transform your //c or enhanced //e into what looks and feels very much like a Macintosh.

The four programs—MouseDesk, MouseWord, MouseCalc, and MouseBudget—are designed to use the increasingly popular Mac interface; you select actions by using a mouse-driven cursor to point to desired options. Menus, "pulled down" from broader topics like Edit or File, display every choice available to you.

### Desk

MouseDesk is a file manager. It's set up as a desktop, with icons for files and options laid out neatly in rows. You can run programs, copy files, and format disks without ever touching the keyboard. An example: To delete a file, scoot the mouse until it points to the file's icon. Press the mouse button and "drag" the icon to a trash-can icon, then release the mouse button. It takes less than two seconds. Copying a file is just as easy and almost as quick.

### Word

MouseWord is a full-featured word processor—not only does it format text, it also includes a mini-calculator, a communications interface, and a mail/merge facility. You can store commonly used words or phrases in MouseWord's glossary; a few clicks of the mouse will retrieve the text and paste it neatly into your document.

What sets MouseWord apart from the dozens of word processors on the market is its use of pull-down menus. While some programs sprinkle memory-jogging graphics around the screen or supply a fold-out command summary, MouseWord puts every command right at your fingertips.

### Calc

MouseCalc is a showcase for the power of the Mac interface. Going from cell to cell in the 254-row-by-63-column spreadsheet is as easy as sliding the mouse to a cell and clicking a button. A built-in graphics package takes information from your grid and produces charts and graphs in any of three formats: bar charts, three-dimensional bar charts, and line graphs.

### Budget

For those who don't need the full power of MouseCalc, or who wish simply to manage household financial affairs, Version Soft has created MouseBudget. With it you can track monthly cash flow, keep a running total of tax-exempt expenses, calculate your net worth, or list your balance sheet. Anything you want to do is only a click of the mouse away.

### A Future Trend

Software publishers are finally realizing that most computerists want to spend their time *using* their software, not reading a manual. Version Soft's Mouse packages are certainly complex, but the pull-down menus put every feature at your fingertips.

"Version Soft has made the Apple II the machine the Mac might have been," according to Review Editor Paul Statt. "The Macintosh interface, created to work the way the human mind works, is a radical way of dealing with information. But the Macintosh is not necessarily the best hardware to use that innovative interface. Programs in the Mouse series are intuitive and easy to run."

"The Version Soft programs are characteristic of where the best of Apple II software is heading," says Editor in Chief Deborah de Peyster. And this software is not just for the novice. Even long-time Apple II users will find its simplified utilities a bonus and reason enough to use this type of program. The rumor mills say that enhanced word-processing and spreadsheet packages are in the works at Version Soft—and that they'll make Mac users jealous. We can't wait.

MouseDesk ($39.95), MouseWord ($129.95), MouseCalc ($149.95), and MouseBudget ($69.95) are marketed in the U.S. by International Solutions, 910 West Maude Avenue, Sunnyvale, CA 94086. ■

# Let's compare Apples™ to Apples™.

*An Apple IIc*

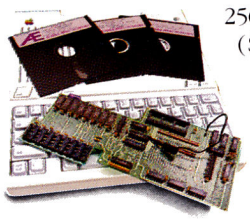
*An Apple IIc with Z-RAM*

The Apple IIc on the right works exactly the same as the Apple IIc on the left. Almost. The Apple on the right has a powerful memory expansion coprocessing card called Z-RAM. From Applied Engineering. Which means the Apple on the right can completely load AppleWorks into RAM—and then run it up to thirty times faster than the Apple on the left.

Z-RAM also acts as a solid-state disk drive. Which means the Apple on the right will load and store programs up to 30 times faster. And, our included RAM disk is compatible with Applesoft, PRO-DOS, DOS 3.3, PASCAL and CP/M.

## Turbo Charged AppleWorks.

Even a 256K Z-RAM can completely load AppleWorks into RAM. With Z-RAM, the moment your fingers touch the keyboard AppleWorks responds. A 256K Z-RAM lets your IIc run AppleWorks up to 30 times faster, increases available desktop to 235K and maximum number of records from 1,350 to over 15,000, quadruples the number of lines allowed in the word processor, provides a print spooler, and auto-segments large files so they can be saved on two or more disks. A 512K Z-RAM boosts AppleWorks desktop to an incredible 425K.



## Take a closer look.

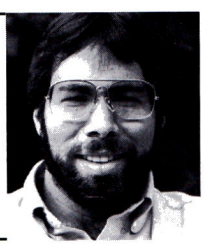
There's more. Z-RAM has a built-in high speed Z-80B microprocessor that allows you to run CP/M programs. Which means you now have access to the single largest body of software in existence, including popular packages like WordStar, dBase II, Turbo PASCAL and Microsoft BASIC. A 16 bit option is also available.

And still more. Z-RAM is compatible with all IIc software and hardware, installs easily in just ten minutes with a screwdriver (slightly longer without), is available with 256K or 512K of additional memory (a 256K Z-RAM can be upgraded to 512K at any time). Z-RAM is easily handled by the IIc power supply with our patent pending power saving design.

The only thing better than that would be a recommendation from Steve Wozniak.

*"I recommend Applied Engineering products wholeheartedly." (Of course, Steve's IIc has a Z-RAM installed.)*

*Steve Wozniak, the creator of Apple Computer*



## For fast response.

Z-RAM comes complete with simple instructions, RAM disk software, Z-80 operating system, CP/M manual. And a five year "hassle free" warranty. Make a good Apple great. With 256K Z-RAM "384K total" ($329); with 512K "640K total" ($389); 16 bit option may be added later ($89).

If you want to run CP/M software, but don't need more memory, we suggest our Z-80c card. The Z-80c has no memory expansion ports and is priced at only $159.

Call 214-241-6060 TO ORDER TODAY. 9 a.m. to 11 p.m. Seven days, or send check or money order to Applied Engineering. MasterCard, Visa and C.O.D. welcome. Texas residents add 5⅛% sales tax. Add $10.00 outside U.S.A.

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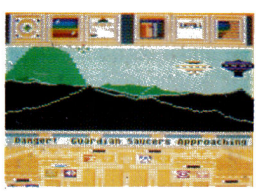
# EPYX PRESENTS LUCASFILM GAMES™. KORONIS RIFT™




It takes all kinds to make a galaxy interesting. Like you, a *techno-scavenger.* Your kind are out to get rich scavenging Ancient technology. And now you've found the fabled Koronis Rift—the weapons testing grounds of the Ancients. The chance of a lifetime awaits you.

Abandoned war hulks litter the Rift—crammed with exotic weapons and technology. The lifelike fractal graphics take you to this mythical land of the Ancients. The mind's-eye point of view puts you right in the driver's seat of a Surface Rover. A hulk looms before you—your mind races, feverishly planning a strategy. What weapons do you need to survive? What technology will fetch the highest price? If you can pack your battered Rover full—you'll be rich beyond your wildest dreams.

But it won't be easy. The Guardians—genetically engineered mutants—stand watch over their creators' technology. And they deal swiftly and ruthlessly with characters like techno-scavengers.

But you've got a plan. If you and your trusty Science Droid can scavenge the right combination of weapons and technology—and get off the planet alive—you'll make it big. Destroy the Guardian base and you'll even be a hero! The treasures of the Ancients are yours . . . if you've got what it takes.

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| *Koronis Rift* | ✓ | ✓ | ✓ |

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**Strategy Games for the Action-Game Player®**

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